

**EPA Superfund  
Record of Decision:**

**MATTIACE PETROCHEMICAL CO., INC.  
EPA ID: NYD000512459  
OU 01  
GLEN COVE, NY  
06/27/1991**

06/27/91  
REGIONAL ADMINISTRATOR

#SNLD

**SITE NAME, LOCATION, AND DESCRIPTION**

THE MATTIACE PETROCHEMICAL CO., INC. SITE ("THE SITE"), WHICH INCLUDES THE 1.9 ACRE PROPERTY OWNED BY MATTIACE PETROCHEMICAL CO. INC., IS LOCATED ON GARVEY'S POINT ROAD IN GLEN COVE ON LONG ISLAND, NEW YORK (FIGURE 1). LIMCO MANUFACTURING CORPORATION, A PRECISION SHEET METAL MANUFACTURER, IS LOCATED ALONG THE EASTERN AND SOUTHERN BORDER OF THE MATTIACE PROPERTY. PROPERTY FORMERLY OWNED BY EDMOS, A KNITTING, DYING, AND FINISHING TEXTILE FABRIC MANUFACTURER, BORDERS THE MATTIACE PROPERTY TO THE WEST. THIS PROPERTY IS PRESENTLY OWNED BY 20 GARVEY'S POINT ROAD CORPORATION AND IS OCCUPIED BY MEDALLION OIL CO. AND VARIOUS OTHER TENANTS. UNDEVELOPED PROPERTY OWNED BY THE GLEN COVE DEVELOPMENT CORPORATION IS LOCATED TO THE NORTH OF THE MATTIACE PROPERTY. A RESIDENTIAL AREA IS LOCATED JUST NORTH OF THIS UNDEVELOPED AREA, WITHIN ONE HUNDRED YARDS OF THE MATTIACE PROPERTY. THE STUDY AREA ALSO CONTAINS THE GARVEY'S POINT PRESERVE, THE GLEN COVE MARINA, RESIDENTIAL AREAS, AND OTHER INDUSTRIAL FACILITIES IN ADDITION TO THOSE MENTIONED ABOVE.

THE MATTIACE FACILITY IS LOCATED APPROXIMATELY 500 FEET DIRECTLY NORTH OF GLEN COVE CREEK. THE CREEK EMPTIES INTO HEMPSTEAD HARBOR APPROXIMATELY 1500 FEET WEST OF THE MATTIACE FACILITY. THE FACILITY, WHICH IS NO LONGER ACTIVE, IS A FENCED ENCLAVE CONTAINING 32 UNDERGROUND AND 24 ABOVEGROUND CHEMICAL STORAGE TANKS OF VARIOUS CAPACITIES. MOST OF THE UNDERGROUND TANKS ARE CONNECTED WITH AN UNDERGROUND MANHOLE PIPING SYSTEM WHICH COLLECTED CHEMICAL OVERFLOWS FROM THE STORAGE TANKS AS WELL AS STORMWATER. THIS COLLECTION SYSTEM LEADS TO A SOLVENT/STORMWATER SEPARATOR IN THE SOUTHEAST PART OF THE PROPERTY WHERE ANY SOLVENTS WERE ALLOWED TO SEPARATE FROM WATER. ALTHOUGH THE SEPARATOR MADE IT POSSIBLE TO SKIM THE SOLVENTS FOR PROPER DISPOSAL AND PUMP THE REMAINING WATER TO ON-SITE LEACHING POOLS, THERE WERE LIKELY OCCASIONS WHEN THE ENTIRE CONTENTS OF THE SOLVENT/STORMWATER SEPARATOR WERE PUMPED DIRECTLY OUT TO THE DRIVEWAY AT THE SOUTHWEST CORNER OF THE SITE.

THE PROPERTY ALSO INCLUDES THE FOLLOWING: A METAL QUONSET BUILDING, IN WHICH DRUM CLEANING AND RECONDITIONING WAS PERFORMED; A WETWELL OUTSIDE THE QUONSET BUILDING INTO WHICH THE PROCESS LIQUIDS FROM DRUM RECONDITIONING WERE DISCHARGED; A CONCRETE FIRE SHED; AND A CONCRETE LOADING DOCK PARTIALLY COVERED BY A SLANTED METAL ROOF. THE SOUTH END OF THE PROPERTY WAS A TRUCK PARKING AREA WHEN THE FACILITY WAS OPERATIONAL. SEE FIGURE 2 FOR A DETAILED DIAGRAM OF THE FACILITY LAYOUT.

THE REGIONAL GEOLOGY IN THE MATTIACE STUDY AREA IS GENERALLY COMPRISED OF 3 UNCONSOLIDATED SEDIMENTS, NAMELY, THE RARITAN FORMATION, THE MAGOTHY FORMATION, AND THE UPPER GLACIAL FORMATION. THE SITE IS UNDERLAIN BY THE UPPER GLACIAL AND MAGOTHY FORMATIONS, UNDER WHICH LAYS THE RARITAN CLAY, WHICH IS A MINIMUM OF 50 FEET THICK AT THE SITE AND OF VERY UNIFORM COMPOSITION LOCALLY.

GROUNDWATER IS A SOURCE OF DRINKING WATER FOR AN ESTIMATED 44,000 PEOPLE IN THE AREA, ALTHOUGH THERE IS PRESENTLY NO INDICATION THAT ANY WATER SUPPLIES ARE CONTAMINATED OR IN DANGER OF CONTAMINATION AS A RESULT OF CONDITIONS AT THE SITE. THIS IS BECAUSE GROUNDWATER CONTAMINATION FROM THE SITE MOVES GENERALLY SOUTHWEST TOWARD GLEN COVE CREEK AND HEMPSTEAD HARBOR, WITH NO INTERVENING PUBLIC WATER SUPPLY WELLS. THE GROUNDWATER CONTAMINATION IS ALSO RESTRICTED TO THE UPPER GLACIAL DEPOSITS ABOVE THE RARITAN CLAY, WHICH SUGGESTS THAT CONTAMINATED GROUNDWATER WILL ULTIMATELY DISCHARGE TO SURFACE WATER, I.E. THE HARBOR OR THE CREEK, AND NOT TRAVEL BENEATH THE HARBOR OR THE CREEK.

#SHEA

**SITE HISTORY AND ENFORCEMENT ACTIVITIES**

THE MATTIACE PETROCHEMICAL COMPANY BEGAN OPERATING IN THE MID-1960'S, RECEIVING CHEMICALS BY TANK TRUCK, BLENDING AND REDISTRIBUTING THEM TO ITS CUSTOMERS. THE PRIMARY OPERATIONS WERE THE STORING, BLENDING, AND REPACKAGING OF ORGANIC SOLVENTS. THESE SOLVENTS WERE STORED IN ABOVEGROUND AND BELOW GROUND TANKS, AND THEY WERE BLENDED AND REPACKAGED IN 55 GALLON DRUMS UNDER A COVERED SECTION OF THE CONCRETE LOADING DOCK LOCATED IN THE NORTHEAST CORNER OF THE PROPERTY. THE 55 GALLON DRUMS WERE STACKED AND TEMPORARILY STORED ON THE LOADING DOCK PRIOR TO SHIPMENT TO VARIOUS BUYERS.

THE METAL QUONSET HUT LOCATED IN THE WESTERN PORTION OF THE PROPERTY WAS USED BY THE M AND M DRUM CLEANING OPERATION TO CLEAN, PRESSURE TEST, AND REPAINT DRUMS. THE M AND M OPERATION AND THE MATTIACE OPERATION WERE BOTH OWNED BY MATTIACE INDUSTRIES. THE RESULTING AQUEOUS/SOLVENT MIXTURE WAS COLLECTED IN A WETWELL IN THE SOUTHEAST EXTERNAL CORNER OF THE QUONSET HUT. THE LIQUIDS IN THIS WETWELL WERE PERIODICALLY DISCHARGED TO ONE OF THE ADJACENT ABOVEGROUND TANKS OR INTO A LEACHING POOL ON THE PROPERTY.

AN UNDERGROUND TANK FARM USED FOR THE STORAGE OF ORGANIC SOLVENTS IS LOCATED IN THE NORTHEAST CORNER OF THE PROPERTY. THIRTY TWO UNDERGROUND AND TWENTY FOUR ABOVEGROUND STORAGE TANKS EXIST MAINLY IN THE NORTHEASTERN SECTION OF THE MATTIACE PROPERTY. THE UNDERGROUND TANKS ARE INTERCONNECTED BY A SPILL PREVENTION SYSTEM. EXCESS MATERIAL FROM OVERFILLED TANKS DRAIN THROUGH A SERIES OF FOUR CONCRETE MANHOLES AND DISCHARGE INTO THE SOLVENT/ STORMWATER SEPARATOR WHICH IS LOCATED IN THE SOUTHEAST CORNER OF THE PROPERTY. THIS SPILL PREVENTION SYSTEM ALSO ACTS AS A STORMWATER COLLECTION SYSTEM. STORMWATER FROM THE LOWER PORTION OF THE SEPARATOR WAS INTENDED TO BE DRAINED BY GRAVITY AND THEN PUMPED INTO THE NORTHWEST LEACH POOLS. HOWEVER, THE LIQUIDS WHICH COLLECTED IN THE SEPARATOR AND PONDED IN THE SOUTHEAST CORNER OF THE PROPERTY WERE SOMETIMES PUMPED THROUGH A HOSE DOWN THE MATTIACE DRIVEWAY WHILE THE FACILITY WAS OPERATIONAL.

IN 1986, THE MATTIACE PETROCHEMICAL COMPANY FILED FOR BANKRUPTCY AS A RESULT OF LEGAL PROBLEMS RESULTING FROM ITS NON-COMPLIANCE WITH VARIOUS ENVIRONMENTAL REGULATIONS. AT THE REQUEST OF THE STATE OF NEW YORK, THE BANKRUPTCY COURT REMOVED THE PROTECTION OF ASSETS NORMALLY EXTENDED TO A REORGANIZING COMPANY IN 1987 IN ORDER TO ENSURE THAT THE COMPANY CEASED OPERATIONS. MEANWHILE, IN AUGUST 1986, A GRAND JURY HANDED UP A 21 COUNT CHARGE AGAINST THE COMPANY AND THREE OF ITS OFFICERS. IN MAY 1988, A JURY RETURNED FELONY CHARGES AGAINST THE COMPANY AND ITS PRESIDENT.

ON JULY 8, 1988, EPA NOTIFIED WILLIAM, OTTO, AND LOUIS MATTIACE OF THEIR STATUS AS POTENTIALLY RESPONSIBLE PARTIES AT THE MATTIACE SITE, AS WELL AS PROVIDED THEM THE OPPORTUNITY TO REMEDIATE THE SITE THROUGH AN EPA CONSENT ORDER. NO OFFER WAS RECEIVED BY EPA IN RESPONSE TO THIS NOTIFICATION. IN AUGUST, 1988, A FEDERAL LIEN WAS PLACED ON THE MATTIACE PROPERTY BY EPA.

#### **#HCP**

##### **HIGHLIGHTS OF COMMUNITY PARTICIPATION**

A COMMUNITY RELATIONS PLAN WAS DEVELOPED FOR THE SITE BY EPA WHICH DESIGNATED THE GLEN COVE PUBLIC LIBRARY AS THE PUBLIC INFORMATION REPOSITORY. ALL PUBLIC INFORMATION CONCERNING THE SITE, INCLUDING THE SITE ADMINISTRATIVE RECORD FILE, IS PRESENTLY LOCATED AT THIS REPOSITORY.

THE PROPOSED PLAN FOR REMEDIATION AT THE SITE WHICH RESULTED FROM THE REMEDIAL INVESTIGATION AND FEASIBILITY STUDY (RI/FS) WAS MAILED ON MAY 14, 1991 TO THE GLEN COVE PUBLIC LIBRARY (AS THE SITE'S PUBLIC INFORMATION REPOSITORY) AND TO THE INDIVIDUALS OR ENTITIES ON THE MAILING LIST FOR THE SITE, WHICH INCLUDED STATE AND LOCAL OFFICIALS AND OTHER INTERESTED PARTIES. GENERAL NOTICE OF THE AVAILABILITY OF THE PROPOSED PLAN WAS PLACED IN LONG ISLAND NEWSDAY ON MAY 17, 1991 AND THE GLEN COVE PILOT RECORD ON MAY 23, 1991 (FIGURES 3 AND 4). AN EPA PRESS RELEASE WAS ALSO ISSUED ON MAY 17, 1991. A PUBLIC MEETING WAS HELD ON MAY 30, 1991, TO SOLICIT PUBLIC COMMENT ON THE RI/FS AND PROPOSED PLAN. THE DURATION OF THE PUBLIC COMMENT PERIOD WAS 30 DAYS AND ENDED ON JUNE 14, 1991.

ALL COMMENTS RECEIVED BY EPA DURING THE PUBLIC COMMENT PERIOD ARE RESPONDED TO IN DETAIL IN THE RESPONSIVENESS SUMMARY WHICH IS ATTACHED AS APPENDIX 4.

#### **#SROU**

##### **SCOPE AND ROLE OF OPERABLE UNIT**

THIS RESPONSE ACTION COMPLEMENTS TWO EARLIER RESPONSE ACTIONS AT THE SITE. EPA INITIATED A REMOVAL ACTION AT THE SITE IN FEBRUARY, 1988, WHICH INCLUDED WASTE CHARACTERIZATION AND OFF-SITE DISPOSAL OF APPROXIMATELY 100,000 GALLONS OF HAZARDOUS SUBSTANCES FROM ABOVEGROUND AND BELOW GROUND TANKS. THE REMOVAL ACTION WAS COMPLETED IN JUNE, 1988.

SUBSEQUENTLY, EPA COMMENCED A COMPREHENSIVE RI AT THE SITE IN OCTOBER, 1989. THE RI INCLUDED THE FOLLOWING: A GEOPHYSICAL SURVEY; A SOIL GAS SURVEY (FIGURE 5); INSTALLATION AND SAMPLING OF 11 GROUNDWATER MONITORING

WELLS AND TWO PIEZOMETERS (FIGURE 6, WHICH ALSO SHOWS 4 WELLS INSTALLED AS PART OF THE PRELIMINARY INVESTIGATION CONDUCTED BY WOODWARD CLYDE); DRILLING AND SAMPLING OF 22 SOIL AND 3 HAND AUGUR BORINGS (FIGURE 7); AND SAMPLING OF GLEN COVE CREEK WATER AND SEDIMENTS (FIGURE 8).

THE GEOPHYSICAL SURVEY WAS PERFORMED TO ASSESS, AMONG OTHER THINGS, THE POSSIBILITY THAT HAZARDOUS SUBSTANCES WERE DISPOSED OF THROUGH BURIAL ON-SITE. THE SURVEY INDICATED THAT SEVERAL AREAS AT THE SITE SHOULD BE FURTHER INVESTIGATED BECAUSE OF THE POSSIBILITY OF BURIED DRUMS OF HAZARDOUS SUBSTANCES. THEREFORE, EPA INITIATED THE SECOND OPERABLE UNIT FOCUSED FEASIBILITY STUDY (FFS) IN DECEMBER, 1989 TO FURTHER DEFINE THE FINDINGS OF THE GEOPHYSICAL INVESTIGATION. WITH THE CREATION OF THE SECOND OPERABLE UNIT AT THE SITE, ALL OTHER ELEMENTS OF THE SITE INVESTIGATION WERE DESIGNATED AS FIRST OPERABLE UNIT ACTIVITIES.

THE SECOND OPERABLE UNIT INVESTIGATION'S OBJECTIVES CONSISTED OF THE IDENTIFICATION OF ANY BURIED DRUMS WHICH CONTAINED HAZARDOUS SUBSTANCES, AS WELL AS THE IDENTIFICATION OF SIGNIFICANTLY CONTAMINATED SOILS. THE INVESTIGATION CONCENTRATED ON THREE AREAS AT THE SITE WHICH WERE SUSPECTED OF BEING USED FOR DRUMMED HAZARDOUS WASTE DISPOSAL. EPA FOUND AN ESTIMATED 25-50 DRUMS BURIED IN THE AREA DESIGNATED SOURCE AREA 1, WHICH IS LOCATED ALONG THE WESTERN PERIMETER OF THE SITE. NO DRUMS WERE FOUND IN ANY OF THE OTHER SUSPECTED SOURCE AREAS. AN FFS REPORT WAS THEN ISSUED WHICH BECAME THE BASIS FOR THE EPA'S SEPTEMBER 27, 1990 RECORD OF DECISION (ROD) FOR REMEDIATION OF SOURCE AREA 1 (FIGURE 9). REMEDIAL ACTION IMPLEMENTING THE REMEDY SELECTED IN THAT ROD IS PRESENTLY UNDERWAY AND SHOULD BE COMPLETED SHORTLY.

THE OVERALL GOAL OF THE FIRST OPERABLE UNIT INVESTIGATION, WHICH IS THE INVESTIGATION UPON WHICH THIS ROD IS BASED, IS TO REDUCE THE CONCENTRATIONS OF ALL SITE CONTAMINANTS TO LEVELS WHICH ARE PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT.

EPA BELIEVES THAT THE SELECTED REMEDY WILL ACHIEVE THIS GOAL BY MEETING THE FOLLOWING REMEDIAL ACTION OBJECTIVES:

- \* REDUCE TO ACCEPTABLE LEVELS THE ON-SITE POTENTIAL HEALTH EFFECTS ASSOCIATED WITH CONTAMINATED SOILS AND RESIDUAL LEAKAGE FROM UNDERGROUND TANKS;
- \* MINIMIZE THE OFF-SITE MIGRATION OF CONTAMINATED GROUNDWATER AND SURFACE RUNOFF TO POTENTIAL ENVIRONMENTAL RECEPTORS; AND,
- \* RESTORE THE GROUNDWATER CURRENTLY BEING DEGRADED AS A RESULT OF THE SITE TO ITS MOST BENEFICIAL USE.

## #SSC

### SUMMARY OF SITE CHARACTERISTICS

THE SOIL CONTAMINATION AT THE SITE IS EXTENSIVE ACROSS THE ENTIRE FACILITY AREA, WITH "HOT SPOTS" OF CONTAMINATION OCCURRING IN SEVERAL LOCATIONS ON THE SITE (ONE OF THESE "HOT SPOTS", THE BURIED DRUM AREA ALONG THE WESTERN BOUNDARY OF THE SITE, IS PRESENTLY BEING REMEDIATED PURSUANT TO THE SECOND OPERABLE UNIT ROD). THESE LOCATIONS ARE GENERALLY ASSOCIATED WITH SEVEN GROUPS OF UNDERGROUND STORAGE TANKS ON THE SITE, AS WELL AS THREE OTHER LOCATIONS CORRESPONDING TO SOIL BORING NUMBERS 5, 9, AND 11, WHICH ARE ALL CONTAMINATED PRIMARILY WITH PESTICIDES. SOME OF THE MORE FREQUENTLY OCCURRING CONTAMINANTS OF CONCERN IN THE SOIL (WITH MAXIMUM CONCENTRATIONS IN PARENTHESES) WERE: TETRACHLOROETHYLENE (410 MILLIGRAMS/KILLIGRAM, OR MG/KG), TRICHLOROETHYLENE (37 MG/KG), XYLENES (2,600 MG/KG), AND 1,4-ALPHA CHLORDANE (9 MG/KG) (TABLE 1).

THE RI ALSO DETERMINED THE EXISTENCE OF SEVERE GROUNDWATER CONTAMINATION IN THE UPPER GLACIAL AQUIFER BENEATH THE SITE. ADDITIONAL DATA GATHERED FROM PREVIOUS INVESTIGATIONS IN THE GARVEY'S POINT AREA AND REVIEWED BY EPA INDICATE PERVASIVE GROUNDWATER CONTAMINATION IN THE AREA, MOST LIKELY AS A RESULT OF ITS COMMERCIAL/INDUSTRIAL NATURE. THE GROUNDWATER CONTAMINATION ATTRIBUTABLE TO THE SITE IS PARTICULARLY SEVERE, AND INCLUDES A LOCALIZED LAYER OF "FLOATING PRODUCT" AT THE TOP OF THE WATER TABLE DIRECTLY UNDER THE SITE. THIS "FLOATING PRODUCT" CONSISTS OF APPROXIMATELY 15,000 GALLONS OF A MIXTURE OF ORGANIC CHEMICALS, INCLUDING TOTAL XYLENES (6 PERCENT BY WEIGHT), TRICHLOROETHYLENE (12 PERCENT), TETRACHLOROETHYLENE (10 PERCENT), AND TOLUENE (12 PERCENT). EXCLUDING THE "FLOATING PRODUCT", ANALYSIS OF GROUNDWATER DURING THE RI INDICATES THE

FOLLOWING CONCENTRATIONS OF SOME CONTAMINANTS OF CONCERN: TETRACHLOROETHYLENE (100 MILLIGRAMS/LITER, OR MG/L), TRICHLOROETHYLENE (230 MG/L), CHLOROFORM (81 MG/L), ETHYLBENZENE (370 MG/L), XYLENES (422 MG/L), METHYLENE CHLORIDE (750 MG/L), ISOPHORONE (57 MG/L), AND 1,2-DICHLOROBENZENE (5.3 MG/L) (TABLE 2). THESE CONCENTRATIONS ARE SEVERAL ORDERS OF MAGNITUDE ABOVE FEDERAL AND STATE DRINKING WATER STANDARDS. THE MOVEMENT OF GROUNDWATER IN THE UPPER GLACIAL AQUIFER IN THE VICINITY OF THE SITE IS SLOW AND GENERALLY IN A SOUTHWEST DIRECTION TOWARD GLEN COVE CREEK. ON THE BASIS OF THE RI, AS WELL AS OTHER INFORMATION SOURCES CONSIDERED DURING THE INVESTIGATION, EPA BELIEVES THAT NONE OF THE AREA'S POTABLE WATER SUPPLY WELLS ARE IN LOCATIONS THAT WOULD CAUSE THEM TO BE PRESENTLY AFFECTED OR THREATENED BY THE GROUNDWATER CONTAMINATION FROM THE SITE.

MOREOVER, IT IS LIKELY THAT CONTAMINATED GROUNDWATER, AS WELL AS SURFACE WATER RUNOFF FROM THE SITE, IS RESPONSIBLE FOR A PORTION OF THE CONTAMINATION THAT EPA DETECTED IN GLEN COVE CREEK'S SEDIMENTS. IT IS VERY DIFFICULT TO DELINEATE AND QUANTIFY THE CONSTITUENTS WHICH COULD BE DIRECTLY RELATED TO THE SITE GIVEN THE DOCUMENTED RELEASES OF ORGANIC CHEMICALS FROM OTHER FACILITIES IN THE AREA, MANY OF WHICH ARE THE SAME AS THOSE SUBSTANCES RELEASED FROM THE MATTIACE FACILITY. EPA'S SAMPLING OF THE CREEK'S SEDIMENTS INDICATED ELEVATED CONCENTRATIONS OF ORGANIC CONTAMINATION, PARTICULARLY SEMI-VOLATILE COMPOUNDS SUCH AS BIS(2-ETHYLHEXYL)PHTHALATE (21 MG/KG), FLUORANTHRENE (7 MG/KG), AND PYRENE (6 MG/KG) (FIGURE 10). SOME INORGANICS, SUCH AS ALUMINUM AND IRON, WERE ALSO FOUND IN HIGH CONCENTRATIONS. THE SEMI-VOLATILE COMPOUNDS DETECTED IN THE CREEK SEDIMENTS WERE ALSO FOUND ON THE SITE DURING THE RI BUT IN RELATIVELY LOW CONCENTRATIONS AND MINOR FREQUENCY OF OCCURRENCE. THEREFORE, IT IS POSSIBLE THAT THE SITE IS A SOURCE OF THESE COMPOUNDS IN THE CREEK SEDIMENTS, BUT THE AMOUNT OF CONTRIBUTION IS SIMILARLY DIFFICULT TO QUANTIFY.

#### #SSR

#### SUMMARY OF SITE RISKS

A BASELINE RISK ASSESSMENT WAS DEVELOPED AS PART OF THE REMEDIAL INVESTIGATION FOR THE SITE. THE RISK ASSESSMENT EVALUATES THE POTENTIAL IMPACTS ON HUMAN HEALTH AND THE ENVIRONMENT IF THE CONTAMINATION AT THE SITE IS NOT REMEDIATED. THIS INFORMATION IS USED BY EPA TO MAKE A DETERMINATION AS TO WHETHER REMEDIATION OF THE SITE IS REQUIRED.

EPA EVALUATED NEARBY RESIDENTS AND OTHERS WHO MIGHT SPEND EXTENDED PERIODS OF TIME ON OR AROUND THE SITE UNDER A CURRENT LAND USE SCENARIO. EPA ALSO USED A SCENARIO BASED ON FUTURE RESIDENTIAL LAND USE AT THE SITE IN ORDER TO ASSESS THE MAXIMUM PLAUSIBLE RISK THAT THE SITE COULD POSE. UNDER BOTH SCENARIOS, SEVERAL EXPOSURE PATHWAYS (DIRECT CONTACT, INHALATION AND INGESTION) WERE EVALUATED FOR SURFACE AND SUBSURFACE SOILS AND AIR, WHILE EXPOSURE TO GROUNDWATER (INGESTION, CONTACT, AND INHALATION) WAS EVALUATED ONLY FOR THE FUTURE USE SCENARIO. EXPOSURE ASSUMPTIONS WERE MADE THAT WOULD INCLUDE CURRENT NEARBY RESIDENTS/WORKERS AND FUTURE ON-SITE RESIDENTS, INCLUDING CHILDREN, AS THE RECEPTORS (OR POTENTIAL RECEPTORS). AN EXPOSURE ASSESSMENT WAS CONDUCTED TO ESTIMATE THE MAGNITUDE, FREQUENCY, AND DURATION OF ACTUAL AND/OR POTENTIAL EXPOSURES TO THE CHEMICALS OF POTENTIAL CONCERN VIA ALL PATHWAYS BY WHICH HUMANS ARE POTENTIALLY EXPOSED. REASONABLE MAXIMUM EXPOSURE IS DEFINED AS THE HIGHEST EXPOSURE THAT IS REASONABLY EXPECTED TO OCCUR AT THE SITE FOR INDIVIDUAL AND COMBINED PATHWAYS.

FOR KNOWN OR SUSPECTED CARCINOGENS, ACCEPTABLE EXPOSURE LEVELS ARE GENERALLY CONCENTRATION LEVELS THAT THEORETICALLY REPRESENT AN EXCESS UPPER BOUND LIFETIME CANCER RISK TO AN INDIVIDUAL OF BETWEEN  $1 \times 10^{-4}$  (OR ONE INCIDENT OF SITE-RELATED CANCER AMONG AN EXPOSED POPULATION OF 10,000 PEOPLE) TO  $1 \times 10^{-6}$  (OR ONE INCIDENT OF SITE-RELATED CANCER AMONG AN EXPOSED POPULATION OF 1,000,000 PEOPLE). EPA DERIVES THIS RISK BY USING EXISTING INFORMATION ON THE RELATIONSHIP BETWEEN DOSE OF CARCINOGEN AND CARCINOGENIC RESPONSE. THE  $10^{-6}$  RISK LEVEL IS USED AS THE POINT OF DEPARTURE FOR DETERMINING REMEDIATION GOALS FOR ALTERNATIVES WHEN REGULATORY STANDARDS OR REQUIREMENTS ARE NOT AVAILABLE OR ARE NOT SUFFICIENTLY PROTECTIVE.

FOR SYSTEMIC TOXICANTS, ACCEPTABLE EXPOSURE LEVELS GENERALLY REPRESENT CONCENTRATION LEVELS TO WHICH THE HUMAN POPULATION, INCLUDING SENSITIVE SUBGROUPS, MAY BE EXPOSED WITHOUT ADVERSE EFFECT.

#### SELECTION OF CONTAMINANTS OF CONCERN

CONTAMINANTS WHICH HAVE INHERENT TOXIC/CARCINOGENIC EFFECTS THAT ARE LIKELY TO POSE THE GREATEST CONCERN WITH RESPECT TO THE PROTECTION OF PUBLIC HEALTH AND THE ENVIRONMENT, AND THAT WERE DETECTED AT THE SITE IN

SIGNIFICANT CONCENTRATIONS AND/OR FREQUENCIES OF OCCURRENCE WERE SELECTED AS CONTAMINANTS OF CONCERN. THE CONTAMINANTS OF CONCERN AT THE MATTIACE SITE ARE PRESENTED IN TABLE 3.

#### EXPOSURE ASSESSMENT

AN EXPOSURE PATHWAY IS THE COURSE A CONTAMINANT TAKES FROM THE SOURCE TO THE EXPOSED RECEPTOR. EXPOSURE PATHWAYS IN GENERAL MUST CONSIST OF THE FOLLOWING FOUR ELEMENTS:

1. A SOURCE AND MECHANISM OF CONSTITUENT RELEASE;
2. A RETENTION OR TRANSPORT MEDIUM;
3. A POINT OF POTENTIAL HUMAN CONTACT WITH THE MEDIUM; AND
4. AN EXPOSURE ROUTE AT THE CONTACT POINT.

IN THIS ASSESSMENT, BOTH CURRENT AND POTENTIAL FUTURE EXPOSURE PATHWAYS ARE CONSIDERED. CURRENT ACTIVITY PATTERNS AT THE SITE ARE EXAMINED TO IDENTIFY CURRENT EXPOSURE POTENTIAL TO RESIDENTS AND WORKERS NEAR THE SITE AS IT PRESENTLY EXISTS. IN DEVELOPING FUTURE EXPOSURE PATHWAYS, IT IS ASSUMED THAT NO FURTHER REMEDIAL ACTIONS WILL BE UNDERTAKEN. IT IS FURTHER ASSUMED THAT A RESIDENTIAL DEVELOPMENT MAY BE CONSTRUCTED ON THE MATTIACE PROPERTY, AND THAT EXPOSURE TO CONTAMINANTS IN SOILS MAY OCCUR DURING AND AFTER THE CONSTRUCTION.

TO QUANTITATIVELY ASSESS THE POTENTIAL RISKS TO HUMAN HEALTH ASSOCIATED WITH THE EXPOSURE SCENARIOS CONSIDERED IN THIS ASSESSMENT, ESTIMATES OF CHRONIC DAILY INTAKES (CDIS) ARE DEVELOPED. CDIS ARE EXPRESSED AS THE AMOUNT OF A SUBSTANCE TAKEN INTO THE BODY PER UNIT BODY WEIGHT PER UNIT TIME, OR MG/KG/DAY. A CDI IS AVERAGED OVER A LIFETIME FOR CARCINOGENS AND OVER THE EXPOSURE PERIOD FOR NONCARCINOGENS. AN AVERAGE CASE AND A REASONABLE MAXIMUM CASE ARE CONSIDERED. THE AVERAGE CASE IS BASED ON AVERAGE (BUT CONSERVATIVE) CONDITIONS OF EXPOSURE AND THE AVERAGE EXPOSURE POINT CONCENTRATIONS. THE REASONABLE MAXIMUM CASE IS BASED ON UPPER-BOUND CONDITIONS OF EXPOSURE AND THE REASONABLE MAXIMUM EXPOSURE POINT CONCENTRATION, AND AS SUCH REPRESENTS THE EXTREME UPPER LIMIT OF POTENTIAL EXPOSURE.

#### TOXICITY ASSESSMENT

CANCER POTENCY FACTORS (CPFS) HAVE BEEN DEVELOPED BY EPA'S CARCINOGENIC ASSESSMENT GROUP FOR ESTIMATING EXCESS LIFETIME CANCER RISKS ASSOCIATED WITH EXPOSURE TO POTENTIALLY CARCINOGENIC CHEMICALS. CPFS, WHICH ARE EXPRESSED IN UNITS OF (MG/KG/DAY)<sup>-4</sup>, ARE MULTIPLIED BY THE ESTIMATED INTAKE OF A POTENTIAL CARCINOGEN, IN MG/KG/DAY, TO PROVIDE AN UPPER BOUND ESTIMATE OF THE EXCESS LIFETIME CANCER RISK ASSOCIATED WITH EXPOSURE AT THAT INTAKE LEVEL. THE TERM "UPPER BOUND" REFLECTS THE CONSERVATIVE ESTIMATE OF THE RISKS CALCULATED FROM THE CPF. USE OF THIS APPROACH MAKES THE UNDERESTIMATION OF THE ACTUAL CANCER RISK HIGHLY UNLIKELY. CPFS ARE DERIVED FROM THE RESULTS OF HUMAN EPIDEMIOLOGICAL STUDIES OR CHRONIC ANIMAL BIOASSAYS TO WHICH ANIMAL-TO-HUMAN EXTRAPOLATION AND UNCERTAINTY FACTORS HAVE BEEN APPLIED.

NONCARCINOGENIC RISKS WERE ASSESSED USING A HAZARD INDEX (HI) COMPUTED FROM EXPECTED DAILY INTAKE LEVELS (SUBCHRONIC AND CHRONIC) AND REFERENCE DOSES, OR RFDS (REPRESENTING ACCEPTABLE INTAKES). POTENTIAL CONCERN FOR NONCARCINOGENIC EFFECTS OF A SINGLE CONTAMINANT IN A SINGLE MEDIUM IS EXPRESSED AS THE HAZARD QUOTIENT (HQ). THIS IS THE RATIO OF THE ESTIMATED INTAKE (DERIVED FROM THE CONTAMINANT CONCENTRATION IN A GIVEN MEDIUM) TO THE CONTAMINANT'S RFD. BY ADDING THE HQS FOR ALL CONTAMINANTS WITHIN A MEDIUM OR ACROSS ALL MEDIA TO WHICH A GIVEN POPULATION MAY REASONABLY BE EXPOSED, THE HI CAN BE GENERATED. THE HI IS USEFUL AS A REFERENCE POINT FOR GAUGING THE POTENTIAL EFFECTS OF ENVIRONMENTAL EXPOSURES TO COMPLEX MIXTURES. IN GENERAL, HIS WHICH ARE LESS THAN ONE ARE NOT LIKELY TO BE ASSOCIATED WITH ANY HEALTH RISK, AND ARE THEREFORE LESS LIKELY TO BE OF CONCERN THAN HIS GREATER THAN ONE.

FOR A LISTING OF THE INDICES OF TOXICITY, I.E. RFDS, CPFS (OR SLOPE FACTORS), PLEASE SEE TABLE 4.

IN ACCORDANCE WITH EPA'S GUIDELINES FOR EVALUATING THE POTENTIAL TOXICITY OF COMPLEX MIXTURES, IT WAS ASSUMED THAT THE TOXIC EFFECTS OF THE SITE-RELATED CHEMICALS WOULD BE ADDITIVE. THUS, LIFETIME EXCESS CANCER RISK AND THE CDI:RFD RATIOS WERE SUMMED TO INDICATE THE POTENTIAL RISKS ASSOCIATED WITH MIXTURES OF POTENTIAL CARCINOGENS AND NONCARCINOGENS, RESPECTIVELY.

UNDER CURRENT EPA GUIDELINES, THE LIKELIHOOD OF CARCINOGENIC AND NONCARCINOGENIC EFFECTS AS A RESULT OF

EXPOSURE TO SITE CHEMICALS ARE CONSIDERED SEPARATELY.

#### RISK CHARACTERIZATION

THE RISK CHARACTERIZATION QUANTIFIES PRESENT AND/OR POTENTIAL FUTURE THREATS TO HUMAN HEALTH THAT RESULT FROM EXPOSURE TO THE CONTAMINANTS OF CONCERN. EPA CALCULATED SIGNIFICANT CARCINOGENIC RISKS ASSOCIATED WITH PROLONGED EXPOSURE TO CONTAMINATED SOILS ON THE MATTIACE PROPERTY. REASONABLE MAXIMUM EXPOSURE RISKS FOR ADULTS WERE ON THE ORDER OF  $3 \times 10^{-3}$  FOR INHALATION, AND  $2 \times 10^{-3}$  FOR DERMAL ABSORPTION, WITH EVEN GREATER RISKS POSED FOR SENSITIVE POPULATIONS, SUCH AS CHILDREN. INHALATION RISKS WERE CHIEFLY AS A RESULT OF AIRBORNE VOLATILE ORGANIC COMPOUNDS, PARTICULARLY TRICHLOROETHYLENE. THE DERMAL ABSORPTION RISK WAS CHIEFLY AS A RESULT OF SEMI-VOLATILE PESTICIDES IN THE SOILS. ADULT NON-CARCINOGENIC RISKS FROM THESE TYPES OF EXPOSURES WERE ALSO SIGNIFICANT, WITH HAZARD INDICES RANGING FROM 6.3 FOR INHALATION (MAINLY FROM A VARIETY OF AIRBORNE VOLATILE ORGANIC COMPOUNDS) TO 23 FOR DERMAL ABSORPTION (MAINLY FROM ALPHA CHLORDANE, A PESTICIDE).

EPA ALSO CALCULATED THE RISK TO PUBLIC HEALTH ASSOCIATED WITH EXPOSURE TO CONTAMINATED GROUNDWATER, EVEN THOUGH NO EXPOSURES ARE PRESENTLY OCCURRING, AS PART OF THE FUTURE RESIDENTIAL USE SCENARIO. EPA CALCULATED AN ADULT CARCINOGENIC RISK FROM THE EXPOSURE TO GROUNDWATER DIRECTLY BENEATH THE SITE OF  $8 \times 10^{-4}$  FOR GROUNDWATER INGESTION (CHIEFLY FROM A VARIETY OF VOLATILE ORGANIC COMPOUNDS), AND  $3 \times 10^{-2}$  FOR DERMAL ABSORPTION (CHIEFLY FROM THE VOLATILE ORGANIC COMPOUNDS CARBON TETRACHLORIDE AND VINYL CHLORIDE). ADULT NON-CARCINOGENIC EFFECTS WERE ALSO SIGNIFICANT, WITH HAZARD INDICES RANGING FROM 4,730 FOR GROUNDWATER INGESTION (CHIEFLY FROM CARBON TETRACHLORIDE) TO 195 FOR DERMAL ABSORPTION (CHIEFLY FROM CARBON TETRACHLORIDE). FOR A COMPLETE LISTING OF THE HEALTH EFFECTS CRITERIA AND THE CALCULATED ADULT RISKS FOR VARIOUS CHEMICALS AND EXPOSURE PATHWAYS, SEE TABLE 4.

MOREOVER, CONTAMINATED GROUNDWATER, AS WELL AS SURFACE WATER RUNOFF FROM THE SITE, IS LIKELY RESPONSIBLE FOR A PORTION OF THE CONTAMINATION THAT EPA FOUND IN GLEN COVE CREEK'S SEDIMENTS. SINCE MOST OF THE CONTAMINANTS FOUND IN HIGH CONCENTRATIONS EXHIBIT LOW WATER SOLUBILITY AND A HIGH AFFINITY FOR ADSORPTION TO SEDIMENTS, IT WOULD BE EXPECTED THAT THEY WOULD TEND TO REMAIN IN THE SEDIMENTS WITH LITTLE DISSOLUTION IN THE OVERLYING WATER COLUMN. THEREFORE, ANY RELEASE OF THESE CONTAMINANTS FROM THE SEDIMENT TO THE WATER COLUMN SHOULD BE INSIGNIFICANT RELATIVE TO THE AMOUNT OF TIDAL "FLUSHING" OF CREEK WATER THAT TAKES PLACE. EPA CONSIDERED HUMAN EXPOSURE TO THESE SEDIMENTS AN UNLIKELY POSSIBILITY (IN PARTICULAR CHRONIC LONG-TERM EXPOSURE), BECAUSE OF THE PRESENT USE AND PHYSICAL NATURE OF THE CREEK, I.E., BOAT TRAFFIC, BULKHEADED (NO EXPOSED SEDIMENTS), ETC. THEREFORE, ONLY THE RISK ASSOCIATED WITH EXPOSURE TO CREEK WATER WAS EVALUATED. THIS ASSESSMENT INDICATES THAT NO UNACCEPTABLE RISKS TO PUBLIC HEALTH ARE POSED BY THE LOW CONTAMINANT CONCENTRATIONS FOUND IN THE CREEK WATER.

SINCE THE CREEK IS CONTIGUOUS WITH HEMPSTEAD HARBOR, AND ULTIMATELY WITH LONG ISLAND SOUND, THE CONTAMINATION FROM THE SITE HAS THE POTENTIAL TO AFFECT ANY OF THE SPECIES OF FLORA AND FAUNA THAT USE OR INHABIT THESE ENVIRONS, ALTHOUGH THE DEGREE OF THE EFFECTS IS DIFFICULT TO QUANTIFY AND WOULD DEPEND, AMONG OTHER THINGS, ON THE DURATION OF EXPOSURE AND ON THE PARTICULAR SPECIES EXPOSED.

MORE SPECIFIC INFORMATION CONCERNING PUBLIC HEALTH RISKS IS CONTAINED IN THE VOLUME ENTITLED REMEDIAL INVESTIGATION REPORT- MATTIACE PETROCHEMICAL SITE (CHAPTER 6-HUMAN HEALTH RISK ASSESSMENT) LOCATED AT THE GLEN COVE PUBLIC LIBRARY.

#### UNCERTAINTIES

THE PROCEDURES AND INPUTS USED TO ASSESS RISKS IN THIS EVALUATION, AS IN ALL SUCH ASSESSMENTS, ARE SUBJECT TO A WIDE VARIETY OF UNCERTAINTIES. IN GENERAL, THE MAIN SOURCES OF UNCERTAINTY INCLUDE:

- \* ENVIRONMENTAL CHEMISTRY SAMPLING AND ANALYSIS
- \* ENVIRONMENTAL PARAMETER MEASUREMENT
- \* FATE AND TRANSPORT MODELING
- \* EXPOSURE PARAMETER ESTIMATION
- \* TOXICOLOGICAL DATA

UNCERTAINTY IN ENVIRONMENTAL SAMPLING ARISES IN PART FROM THE POTENTIALLY UNEVEN DISTRIBUTION OF CHEMICALS IN THE MEDIA SAMPLED. CONSEQUENTLY, THERE IS SIGNIFICANT UNCERTAINTY AS TO THE ACTUAL LEVELS PRESENT. IN THE CASE OF SOILS, THE CONSERVATIVE MODELS USED ASSUME THAT THE CONTAMINANT IS PRESENT AT THE MAXIMUM DETECTED CONCENTRATION THROUGHOUT THE VOLUME OF SOILS BEING EXAMINED. ENVIRONMENTAL CHEMISTRY ANALYSIS ERROR CAN STEM FROM SEVERAL SOURCES, INCLUDING THE ERRORS INHERENT IN THE ANALYTICAL METHODS, CHAIN OF CUSTODY PROBLEMS, AND CHARACTERISTICS OF THE MATRIX BEING SAMPLED. ENVIRONMENTAL PARAMETER MEASUREMENTS PRIMARILY CONTRIBUTE TO UNCERTAINTY BECAUSE LITTLE VERIFIED INFORMATION IS AVAILABLE.

IN THE SITE RISK ASSESSMENT THERE ARE UNCERTAINTIES REGARDING THE ESTIMATES OF HOW OFTEN, IF AT ALL, AN INDIVIDUAL WOULD COME IN CONTACT WITH THE CHEMICALS OF CONCERN AND THE PERIOD OF TIME OVER WHICH SUCH EXPOSURE WOULD OCCUR. IN PARTICULAR, THIS APPLIES TO THE FUTURE RESIDENTIAL EXPOSURES. THERE IS ALSO SIGNIFICANT UNCERTAINTY IN THE MODELS USED TO ESTIMATE EXPOSURE POINT CONCENTRATIONS.

TOXICOLOGICAL DATA ERROR (POTENTIALLY OCCURRING IN EXTRAPOLATING BOTH FROM ANIMALS TO HUMANS AND FROM HIGH TO LOW DOSES) IS ALSO A LARGE SOURCE OF POTENTIAL ERROR IN THIS RISK ASSESSMENT. THERE IS ALSO A GREAT DEAL OF UNCERTAINTY IN ASSESSING THE TOXICITY OF A MIXTURE OF CHEMICALS. IN THIS ASSESSMENT, THE EFFECTS OF EXPOSURE TO EACH OF THE CONTAMINANTS PRESENT IN THE ENVIRONMENTAL MEDIA HAVE INITIALLY BEEN CONSIDERED SEPARATELY. THE SEPARATE EVALUATION AND SUBSEQUENT SUMMATION OF CONTAMINANT-SPECIFIC RISK MAY NOT ACCOUNT FOR POTENTIAL SYNERGISTIC OR ANTAGONISTIC INTERACTIONS OF CHEMICAL MIXTURES.

IN SUMMARY, ACTUAL OR THREATENED RELEASES OF HAZARDOUS SUBSTANCES FROM THIS SITE, IF NOT ADDRESSED BY THE SELECTED REMEDY OR ONE OF THE OTHER ACTIVE MEASURES CONSIDERED, MAY PRESENT A CURRENT OR POTENTIAL THREAT TO PUBLIC HEALTH AND THE ENVIRONMENT THROUGH, AT A MINIMUM, ANY OF THE FOLLOWING EXPOSURE PATHWAYS: INHALATION OF PARTICULATES AND/OR VAPORS FROM CONTAMINATED SOILS, DERMAL ABSORPTION OF CONTAMINATED SOILS, UNDER BOTH THE CURRENT LAND USE AND A FUTURE RESIDENTIAL LAND USE SCENARIO, AND INGESTION, INHALATION OR DERMAL ABSORPTION OF CONTAMINATED GROUNDWATER UNDER A FUTURE RESIDENTIAL LAND USE SCENARIO.

THE FS, IN WHICH REMEDIAL ALTERNATIVES ARE DEVELOPED, SCREENED, AND THEN CAREFULLY EVALUATED IN DETAIL, FORMS THE BASIS FOR THE SELECTED REMEDY.

## **#DA**

### **DESCRIPTION OF ALTERNATIVES**

CERCLA REQUIRES THAT EACH SELECTED SITE REMEDY BE PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT, BE COST EFFECTIVE, COMPLY WITH OTHER STATUTORY LAWS, AND UTILIZE PERMANENT SOLUTIONS, ALTERNATIVE TECHNOLOGIES, AND RESOURCE RECOVERY ALTERNATIVES TO THE MAXIMUM EXTENT PRACTICABLE. IN ADDITION, THE STATUTE INCLUDES A PREFERENCE FOR THE USE OF TREATMENT AS A PRINCIPAL ELEMENT FOR THE REDUCTION OF TOXICITY, MOBILITY, OR VOLUME OF THE HAZARDOUS SUBSTANCES.

THE REMEDIAL ALTERNATIVES CONSIDERED IN THE FS ARE ORGANIZED ACCORDING TO THE MEDIA WHICH THEY ADDRESS: SOIL CONTAMINATION ("SC") AND MANAGEMENT OF MIGRATION OF GROUNDWATER ("MOM"). THESE ALTERNATIVES WERE SCREENED BASED ON IMPLEMENTABILITY, EFFECTIVENESS, AND COST. THE SCREENING RESULTED IN REMEDIAL ALTERNATIVES UPON WHICH A DETAILED ANALYSIS WAS PERFORMED. A "NO ACTION" ALTERNATIVE WAS ALSO EVALUATED IN THE FS, AS REQUIRED BY REGULATION, TO PROVIDE AN APPROPRIATE ALTERNATIVE IN THE EVENT THAT NO CONTRAVENTION OF STANDARDS NOR SIGNIFICANT HEALTH OR ENVIRONMENTAL RISKS WERE IDENTIFIED AS A RESULT OF THE SITE CONTAMINATION.

THE ALTERNATIVES PRESENTED BELOW ARE THOSE WHICH WERE EVALUATED IN DETAIL FOLLOWING THE PRELIMINARY SCREENING OF ALTERNATIVES. THESE ALTERNATIVES HAVE RETAINED THEIR PRE-SCREENING ALPHANUMERICAL DESIGNATIONS IN ORDER TO CORRESPOND WITH THE DESCRIPTIONS OF THE ALTERNATIVES WHICH ARE CONTAINED IN THE FS REPORT. THE PRESENT WORTH COSTS ARE ESTIMATES WHICH TAKE INTO ACCOUNT BOTH THE CAPITAL COST AND THE OPERATION AND MAINTENANCE (O AND M) COSTS FOR UP TO 30 YEARS. "TIME TO IMPLEMENT" IS DEFINED AS THE PERIOD OF TIME NEEDED FOR THE ALTERNATIVE TO BE STARTED (E.G., AMOUNT OF TIME NEEDED FOR DESIGN AND CONSTRUCTION OF A TREATMENT FACILITY). THE REMEDIAL ALTERNATIVES CONSIDERED FOR ADDRESSING THE SOIL CONTAMINATION AT THE SITE ARE AS FOLLOWS:

#### **SOILS**

SC-1: NO ACTION



- SC-3: A. IN SITU VACUUM EXTRACTION OF GENERAL SITE AREA/EXCAVATION OF ALL "HOT SPOTS" WITH OFF-SITE TREATMENT AND DISPOSAL
- B. IN SITU VACUUM EXTRACTION OF GENERAL SITE AREA AND NON-PESTICIDE "HOT SPOTS"/EXCAVATION OF PESTICIDE "HOT SPOTS" WITH OFF-SITE TREATMENT AND DISPOSAL
- C. IN SITU VACUUM EXTRACTION OF GENERAL SITE AREA AND NON-PESTICIDE "HOT SPOTS"

SC-5: ON-SITE LOW TEMPERATURE THERMAL TREATMENT OF GENERAL SITE AREA AND ALL "HOT SPOTS"

SC-1: NO ACTION

|  |           |
|--|-----------|
| CAPITAL COST:                                | \$71,876  |
| ANNUAL OPERATION AND MAINTENANCE (O&M) COST: | \$11,305  |
| PRESENT WORTH COST:                          | \$245,656 |
| TIME TO IMPLEMENT:                           | 2 MONTHS  |

THE SUPERFUND PROGRAM REQUIRES THAT THE NO ACTION ALTERNATIVE BE CONSIDERED AS A BASELINE FOR COMPARISON WITH OTHER ALTERNATIVES. UNDER THIS ALTERNATIVE, THE CONTAMINATED SOIL WOULD BE LEFT IN PLACE WITHOUT TREATMENT. ALSO, INSTALLATION OF ADDITIONAL SECURITY MEASURES, SUCH AS REPAIRS AND MODIFICATIONS AS NECESSARY TO THE EXISTING FENCING AND THE USE OF ELECTRONIC DEVICES TO DETECT TRESPASSING (WITH SUBSEQUENT NOTIFICATION OF LOCAL AUTHORITIES) WOULD BE PERFORMED AS NEEDED. NO ACTION WOULD ALSO INCLUDE A PUBLIC EDUCATION PROGRAM IN ORDER TO INCREASE PUBLIC AWARENESS OF SITE CONDITIONS AND HAZARDS. SINCE THIS ALTERNATIVE WOULD INVOLVE NO CONTAMINANT REMOVAL, CERCLA REQUIRES THAT THE SITE BE REVIEWED EVERY FIVE YEARS. IF JUSTIFIED BY THE REVIEW, REMEDIAL ACTIONS MAY BE IMPLEMENTED IN THE FUTURE TO REMOVE OR TREAT THE WASTES.

SC-3: A. IN SITU VACUUM EXTRACTION OF GENERAL SITE AREA/EXCAVATION OF ALL "HOT SPOTS" WITH OFF-SITE TREATMENT AND DISPOSAL

|                     |              |
|---------------------|--------------|
| CAPITAL COST:       | \$17,896,733 |
| ANNUAL O&M COST:    | \$73,699     |
| PRESENT WORTH COST: | \$18,097,415 |
| TIME TO IMPLEMENT:  | 36 MONTHS    |

THIS ALTERNATIVE INVOLVES IN SITU TREATMENT OF 11,950 CUBIC YARDS (CY) OF CONTAMINATED SOIL BY MEANS OF VACUUM EXTRACTION, AND EXCAVATION OF 6,956 CY OF SOIL (WHICH INCLUDES EXCAVATION SOIL EXPANSION FACTOR). FOR COSTING PURPOSES, OFF-SITE TREATMENT WAS ASSUMED TO BE INCINERATION, ALTHOUGH OTHER MORE INNOVATIVE TECHNOLOGY MAY EVENTUALLY BE SELECTED ON THE BASIS OF COST AND TREATMENT EQUIVALENCE.

IN SITU EXTRACTION, OR REMOVAL OF ORGANIC CONTAMINANTS FROM THE SOIL WITHOUT MAJOR SOIL DISTURBANCE, IS ACCOMPLISHED BY INSTALLING SOIL VAPOR EXTRACTION WELLS AT STRATEGIC POINTS, MANIFOLDING THE WELLS, AND APPLYING A VACUUM IN ORDER TO DRAW CONTAMINATED SOIL GASES OUT OF THE GROUND AND INTO A TREATMENT SYSTEM. THE TREATMENT SYSTEM IS COMPRISED OF A VAPOR/LIQUID SEPARATOR. IT WAS ASSUMED THAT AN ACTIVATED CARBON CANISTER WOULD BE UTILIZED FOR OFF-GAS EMISSION, ALTHOUGH EQUIVALENT TECHNOLOGIES COULD BE UTILIZED. SPENT ACTIVATED CARBON WOULD BE REGENERATED FOR REUSE AT AN OFF-SITE LOCATION. THE IN SITU VACUUM EXTRACTION SYSTEM WOULD BE OPERATED UNTIL SOIL CLEANUP LEVELS CORRESPONDING TO EPA'S TARGET RISK LEVEL OF  $1 \times 10^{-6}$  ARE ACHIEVED.

THE SOIL CLEANUP LEVELS OF SELECTED INDICATOR CHEMICALS WHICH HAVE BEEN DETERMINED BY EPA TO CORRESPOND TO A  $1 \times 10^{-6}$  RISK LEVEL ARE GIVEN BELOW:

| CHEMICAL          | CLEANUP LEVEL<br>(MG/KG) |
|-------------------|--------------------------|
| VOLATILE ORGANICS |                          |

|                      |      |
|----------------------|------|
| TETRACHLOROETHYLENE  | 0.6  |
| TRICHLOROETHYLENE    | 0.07 |
| 4-METHYL-2-PENTANONE | 52.1 |
| XYLENE               | 259  |

#### PESTICIDES

|                    |      |
|--------------------|------|
| ALDRIN             | 0.04 |
| ALPHA CHLORDANE    | 0.5  |
| HEPTACHLOR EPOXIDE | 0.07 |

THE EXCAVATION OF SOILS FOR OFF-SITE TREATMENT AND DISPOSAL WOULD INCLUDE EXCAVATION OF ALL SOIL "HOT SPOTS", OR AREAS OF SOIL CONTAMINATION THAT IS MORE HIGHLY CONCENTRATED THAN THE SURROUNDING SOIL CONTAMINATION AT THE SITE. THE OFF-SITE TRANSPORTATION, TREATMENT, AND DISPOSAL WOULD CONFORM TO APPLICABLE/APPROPRIATE REQUIREMENTS OF THE RESOURCE CONSERVATION AND RECOVERY ACT ("RCRA"), INCLUDING LAND DISPOSAL REQUIREMENTS ("LDR"), AS WELL AS THE REQUIREMENTS OF STATE HAZARDOUS WASTE LAWS AND REGULATIONS. ANY HAZARDOUS RESIDUALS RESULTING FROM ONSITE VACUUM EXTRACTION TREATMENT WOULD BE SIMILARLY DISPOSED OF OR RECYCLED OFF-SITE. CLEAN FILL WOULD BE USED TO BACKFILL EXCAVATED AREAS. EPA BELIEVES THAT THIS ALTERNATIVE WOULD BE EFFECTIVE IN ACHIEVING REDUCTION OF HUMAN CARCINOGENIC RISK POSED BY CONTAMINATED SOILS AT THE SITE TO APPROXIMATELY  $1 \times 10^{-6}$ .

THIS ALTERNATIVE WOULD ALSO INCLUDE THE DECONTAMINATION (AS NECESSARY), DEMOLITION, REMOVAL, AND LANDFILL DISPOSAL OF THE QUONSET HUT, 24 ABOVEGROUND STORAGE TANKS, 32 UNDERGROUND STORAGE TANKS, AND 1,360 CY OF CONCRETE AND ASPHALT. TREATABILITY STUDIES WOULD ALSO HAVE TO BE PERFORMED TO DETERMINE DESIGN PARAMETERS AND THE NEED FOR TREATMENT OF OFF-GASES FOR THE VACUUM EXTRACTION SYSTEM.

#### SC-3: B. IN SITU VACUUM EXTRACTION OF GENERAL SITE AREA AND NON-PESTICIDE "HOT SPOTS"/EXCAVATION OF PESTICIDE "HOT SPOTS" WITH OFF-SITE TREATMENT AND DISPOSAL

|                     |             |
|---------------------|-------------|
| CAPITAL COST:       | \$3,227,566 |
| ANNUAL O&M COST:    | \$100,138   |
| PRESENT WORTH COST: | \$3,500,242 |
| TIME TO IMPLEMENT:  | 36 MONTHS   |

THIS ALTERNATIVE IS THE SAME AS ALTERNATIVE SC-3A, WITH THE EXCEPTION THAT ONLY THE PESTICIDE "HOT SPOTS" WOULD BE EXCAVATED FOR OFF-SITE TREATMENT AND DISPOSAL, WHILE THE REMAINING SOILS WOULD BE TREATED ONSITE TO MEET THE CLEANUP LEVELS SPECIFIED IN ALTERNATIVE SC-3A USING IN SITU VACUUM EXTRACTION TECHNOLOGY.

SPECIFICALLY, THIS ALTERNATIVE WOULD INVOLVE IN SITU TREATMENT OF 17,141 CY OF CONTAMINATED SOIL BY MEANS OF VACUUM EXTRACTION, AND EXCAVATION OF 208 CY OF SOIL (WHICH INCLUDES EXCAVATION SOIL EXPANSION FACTOR) CONTAMINATED PRIMARILY WITH PESTICIDES FOR OFF-SITE TREATMENT AND DISPOSAL, IN ACCORDANCE WITH APPLICABLE/APPROPRIATE REQUIREMENTS OF RCRA, AS WELL AS THE REQUIREMENTS OF STATE HAZARDOUS WASTE LAWS AND REGULATIONS. FOR COSTING PURPOSES, OFF-SITE TREATMENT WAS ASSUMED TO BE INCINERATION, ALTHOUGH OTHER MORE INNOVATIVE TECHNOLOGY MAY EVENTUALLY BE SELECTED ON THE BASIS OF COST AND TREATMENT EQUIVALENCE.

THE EXCAVATION OF SOILS FOR OFF-SITE TREATMENT AND DISPOSAL WOULD ONLY INCLUDE EXCAVATION OF THE PESTICIDE "HOT SPOTS". CLEAN FILL WOULD BE USED TO BACKFILL EXCAVATED AREAS. EPA BELIEVES THAT THIS ALTERNATIVE WOULD BE EFFECTIVE IN ACHIEVING REDUCTION OF HUMAN CARCINOGENIC RISK POSED BY CONTAMINATED SOILS AT THE SITE TO APPROXIMATELY  $1 \times 10^{-6}$ .

THIS ALTERNATIVE WOULD ALSO INCLUDE THE DECONTAMINATION (AS NECESSARY), DEMOLITION, REMOVAL, AND LANDFILL DISPOSAL OF THE QUONSET HUT, 24 ABOVEGROUND STORAGE TANKS, 32 UNDERGROUND STORAGE TANKS, AND 1,360 CY OF CONCRETE AND ASPHALT. TREATABILITY STUDIES WOULD ALSO HAVE TO BE PERFORMED TO DETERMINE DESIGN PARAMETERS AND THE NEED FOR TREATMENT OF OFF-GASES FOR THE VACUUM EXTRACTION SYSTEM.

#### SC-3: C. IN SITU VACUUM EXTRACTION OF GENERAL SITE AREA AND NON-PESTICIDE "HOT SPOTS"

|                     |             |
|---------------------|-------------|
| CAPITAL COST:       | \$2,731,392 |
| ANNUAL O&M COST:    | \$100,138   |
| PRESENT WORTH COST: | \$3,004,068 |
| TIME TO IMPLEMENT:  | 36 MONTHS   |

THIS ALTERNATIVE IS THE SAME AS ALTERNATIVE SC-3B, WITH THE EXCEPTION THAT THE PESTICIDE "HOT SPOTS" WOULD NOT BE EXCAVATED FOR OFF-SITE TREATMENT AND DISPOSAL. SPECIFICALLY, THIS ALTERNATIVE INVOLVES IN SITU VACUUM EXTRACTION OF THE ENTIRE CONTAMINATED SOIL VOLUME OF 17,301 CY TO THE SOIL CLEANUP LEVELS SPECIFIED IN ALTERNATIVE SC-3A FOR VOLATILE ORGANICS. HOWEVER, CLEANUP LEVELS FOR PESTICIDES WOULD NOT BE ATTAINABLE IN THE PESTICIDE "HOT SPOTS", SINCE THE THREE PESTICIDES OF CONCERN AT THE SITE ARE NOT SIGNIFICANTLY AFFECTED BY VACUUM EXTRACTION TECHNOLOGY.

EPA BELIEVES THAT THIS ALTERNATIVE WOULD BE EFFECTIVE IN ACHIEVING REDUCTION OF HUMAN CARCINOGENIC RISK POSED BY CONTAMINATED SOILS AT THE SITE TO APPROXIMATELY  $1 \times 10^{-4}$ . THIS INCREASE IN POTENTIAL HUMAN HEALTH RISK IS CAUSED BY LEAVING THE 3 LOCALIZED PESTICIDE "HOT SPOTS" ON-SITE (TOTTALLING 160 CY COMPACTED VOLUME).

THIS ALTERNATIVE WOULD ALSO INCLUDE THE DECONTAMINATION (AS NECESSARY), DEMOLITION, REMOVAL, AND LANDFILL DISPOSAL OF THE QUONSET HUT, 24 ABOVEGROUND STORAGE TANKS, 32 UNDERGROUND STORAGE TANKS, AND 1,360 CY OF CONCRETE AND ASPHALT. TREATABILITY STUDIES WOULD ALSO HAVE TO BE PERFORMED TO DETERMINE DESIGN PARAMETERS AND THE NEED FOR TREATMENT OF OFF-GASES FOR THE VACUUM EXTRACTION SYSTEM.

SC-5: ON-SITE LOW TEMPERATURE THERMAL TREATMENT OF GENERAL SITE AREA AND ALL "HOT SPOTS"

|                     |              |
|---------------------|--------------|
| CAPITAL COST:       | \$8,378,012  |
| ANNUAL O&M COST:    | \$1,089,526  |
| PRESENT WORTH COST: | \$11,344,791 |
| TIME TO IMPLEMENT:  | 33 MONTHS    |

IN THIS ALTERNATIVE, APPROXIMATELY 22,490 CY (WHICH INCLUDES EXCAVATION SOIL EXPANSION FACTOR) OF CONTAMINATED SOILS WOULD BE EXCAVATED AND THEN FED INTO A LOW-TEMPERATURE THERMAL PROCESSOR LOCATED ON-SITE. THE PROCESSOR WOULD OPERATE AT A TEMPERATURE OF APPROXIMATELY 400 DEGREE FAHRENHEIT WHICH IS SUFFICIENT TO VAPORIZE THE ORGANIC COMPOUNDS, INCLUDING THE PESTICIDES, PRESENT IN THE SOILS. AFTER TREATMENT, THE SOIL WOULD BE TESTED TO ASSURE IT MEETS BOTH RCRA AND THE SOIL CLEANUP LEVELS SPECIFIED IN ALTERNATIVE SC-3A PRIOR TO BEING USED AS BACKFILL. TREATMENT OF OFF-GASES FROM THIS ALTERNATIVE, THROUGH THE USE OF CARBON OR AN EQUIVALENT TECHNOLOGY, HAS BEEN ASSUMED NECESSARY TO COMPLY WITH THE CLEAN AIR ACT AND APPLICABLE/APPROPRIATE STATE STACK EMISSION REGULATIONS. THIS ASSUMPTION WOULD BE CONFIRMED DURING DESIGN TESTING.

EPA BELIEVES THAT THIS ALTERNATIVE WOULD BE EFFECTIVE IN ACHIEVING REDUCTION OF HUMAN CARCINOGENIC RISK POSED BY CONTAMINATED SOILS AT THE SITE TO APPROXIMATELY  $1 \times 10^{-6}$ .

THIS ALTERNATIVE WOULD ALSO INCLUDE THE DECONTAMINATION (AS NECESSARY), DEMOLITION, REMOVAL, AND LANDFILL DISPOSAL OF THE QUONSET HUT, 24 ABOVEGROUND STORAGE TANKS, 32 UNDERGROUND STORAGE TANKS, AND 1,360 CY OF CONCRETE AND ASPHALT. TREATABILITY STUDIES WOULD ALSO HAVE TO BE PERFORMED TO DETERMINE DESIGN PARAMETERS AND THE NEED FOR TREATMENT OF OFF-GASES FOR THE VACUUM EXTRACTION SYSTEM.

GROUNDWATER

MOM-1: NO ACTION

MOM-3: GROUNDWATER EXTRACTION/ AIR STRIPPING/ THERMAL TREATMENT OF AIR EFFLUENT/ CARBON ADSORPTION OF WATER EFFLUENT/REINJECTION OF TREATED EFFLUENT

MOM-6: GROUNDWATER EXTRACTION/ UV-PEROXIDE OXIDATION/REINJECTION OF TREATED EFFLUENT

MOM-1: NO ACTION

|                     |             |
|---------------------|-------------|
| CAPITAL COST:       | 0           |
| ANNUAL O&M COST:    | \$114,131   |
| PRESENT WORTH COST: | \$1,754,422 |
| TIME TO IMPLEMENT:  | IMMEDIATE   |

THE NO ACTION ALTERNATIVE FOR GROUNDWATER WOULD INVOLVE SEMI-ANNUAL MONITORING OF GROUNDWATER MONITORING WELLS ASSOCIATED WITH THE SITE, IN ORDER TO ASSESS FUTURE MOVEMENT OF THE GROUNDWATER PLUME OF CONTAMINATION. ANNUAL MONITORING OF GLEN COVE CREEK'S WATER AND SEDIMENTS WOULD ALSO BE INCLUDED AS PART OF THE MONITORING PLAN.

MOM-3: GROUNDWATER EXTRACTION/ AIR STRIPPING/THERMAL TREATMENT OF AIR EFFLUENT/ CARBON ADSORPTION OF WATER EFFLUENT/REINJECTION OF TREATED EFFLUENT

|                     |              |
|---------------------|--------------|
| CAPITAL COST:       | \$3,316,921  |
| O&M COST:           | \$592,859    |
| PRESENT WORTH COST: | \$12,430,350 |
| TIME TO IMPLEMENT:  | 22 MONTHS    |

IN THIS ALTERNATIVE, EXTRACTION AND INJECTION WELLS WOULD BE INSTALLED INTO THE CONTAMINATED GROUNDWATER PLUME. FOR COSTING PURPOSES, EPA ESTIMATED THAT 8 EXTRACTION WELLS WOULD BE REQUIRED IN ORDER TO CAPTURE AND REMOVE THE PLUME OF CONTAMINATED GROUNDWATER. FIRST, THE "FLOATING PRODUCT" BENEATH THE SITE WOULD BE REMOVED THROUGH THE EXTRACTION WELLS WITH A SKIMMER PUMP, WITH SUBSEQUENT OFF-SITE TREATMENT AND DISPOSAL IN ACCORDANCE WITH THE APPROPRIATE REQUIREMENTS OF RCRA. NEXT, THE CONTAMINATED GROUNDWATER WOULD BE PUMPED, PRETREATED THROUGH PRECIPITATION AND CLARIFICATION TO REMOVE IRON AND MANGANESE (THESE METALS WOULD INTERFERE WITH SUBSEQUENT TREATMENT) AND TREATED VIA AIR STRIPPING TO REMOVE VOLATILE ORGANICS. THE AIR EFFLUENT WOULD THEN BE THERMALLY TREATED TO MEET THE APPLICABLE/APPROPRIATE REQUIREMENTS OF THE CLEAN AIR ACT AND STATE LAWS AND REGULATIONS. THE WATER EFFLUENT FROM THE AIR STRIPPER WOULD BE CARBON-TREATED IN ORDER TO REDUCE THE LEVEL OF ANY REMAINING ORGANIC CONTAMINANTS TO MEET APPLICABLE/ APPROPRIATE REQUIREMENTS OF THE SAFE DRINKING WATER ACT AND STATE LAWS AND REGULATIONS PRIOR TO REINJECTION INTO THE GROUND THROUGH GROUNDWATER REINJECTION WELLS. FOR COSTING PURPOSES, EPA ESTIMATED THAT FOUR REINJECTION WELLS WOULD BE NECESSARY. ACTUAL LOCATIONS OF EXTRACTION AND REINJECTION WELLS WOULD BE DETERMINED FROM ADDITIONAL GROUNDWATER MONITORING DURING THE DESIGN PHASE OF THE PROJECT. SPENT ACTIVATED CARBON WOULD BE REGENERATED AT AN OFF-SITE LOCATION FOR REUSE. ANY HAZARDOUS RESIDUALS RESULTING FROM ON-SITE TREATMENT WOULD BE DISPOSED OF OFF-SITE IN ACCORDANCE WITH THE APPLICABLE/APPROPRIATE REQUIREMENTS OF RCRA AND STATE HAZARDOUS WASTE LAWS AND REGULATIONS.

AN EXAMPLE OF SOME OF THE APPLICABLE OR APPROPRIATE AND RELEVANT REQUIREMENTS FOR GROUNDWATER REMEDIATION AT THIS SITE ARE:

| CHEMICAL            | REQUIREMENT | REFERENCE               |
|---------------------|-------------|-------------------------|
| TETRACHLOROETHYLENE | 5 UG/L      | PART 5-NY SANITARY CODE |
| TRICHLOROETHYLENE   | 5 UG/L      | 40 CFR PARTS 141 & 142  |
| ETHYLBENZENE        | 5 UG/L      | PART 5-NY SANITARY CODE |
| TOTAL XYLENES       | 5 UG/L      | PART 5-NY SANITARY CODE |
| METHYLENE CHLORIDE  | 5 UG/L      | PART 5-NY SANITARY CODE |
| O-DICHLOROBENZENE   | 5 UG/L      | PART 5-NY SANITARY CODE |

THIS ALTERNATIVE WOULD INVOLVE SEMI-ANNUAL MONITORING OF GROUNDWATER MONITORING WELLS ASSOCIATED WITH THE SITE IN ORDER TO ASSESS FUTURE MOVEMENT OF THE GROUNDWATER PLUME OF CONTAMINATION. ANNUAL MONITORING OF GLEN COVE CREEK'S WATER AND SEDIMENTS WOULD ALSO BE INCLUDED AS PART OF THE MONITORING PLAN. IN ADDITION, EPA WOULD CONDUCT 5 YEAR REVIEWS OF THE SITE AS CERCLA REQUIRES IN ORDER TO ENSURE THAT THE HUMAN HEALTH AND THE ENVIRONMENT WERE ADEQUATELY PROTECTED.

MOM-6: GROUNDWATER EXTRACTION/ UV-PEROXIDE OXIDATION/REINJECTION OF TREATED EFFLUENT

|               |             |
|---------------|-------------|
| CAPITAL COST: | \$5,663,820 |
| O&M COST:     | \$1,597,227 |

PRESENT WORTH COST:       \$30,216,393  
TIME TO IMPLEMENT:       21 MONTHS

THIS ALTERNATIVE IS THE SAME AS MOM-3, EXCEPT IN THE METHOD OF CONTAMINATED GROUNDWATER TREATMENT. UNDER MOM-6, AN ULTRAVIOLET RADIATION/OXIDATION SYSTEM WOULD BE UTILIZED TO TREAT ORGANIC CONTAMINANTS FROM THE EXTRACTED GROUNDWATER TO ACCEPTABLE LEVELS.

OFF-GAS AND WATER EFFLUENTS FROM THIS TREATMENT PROCESS WOULD BE FURTHER "POLISHED" IN AN OZONE REDUCTION UNIT (AIR) AND IN A CARBON UNIT (WATER). THE CARBON UNIT WOULD REDUCE THE LEVEL OF ANY REMAINING ORGANIC CONTAMINANTS TO MEET APPLICABLE/APPROPRIATE REQUIREMENTS OF THE SAFE DRINKING WATER ACT AND STATE LAWS AND REGULATIONS, PRIOR TO REINJECTION INTO THE GROUND THROUGH GROUNDWATER REINJECTION WELLS.

THIS ALTERNATIVE WOULD ALSO INVOLVE SEMI-ANNUAL MONITORING OF GROUNDWATER MONITORING WELLS ASSOCIATED WITH THE SITE, IN ORDER TO ASSESS FUTURE MOVEMENT OF THE GROUNDWATER PLUME OF CONTAMINATION. ANNUAL MONITORING OF GLEN COVE CREEK'S WATER AND SEDIMENTS WOULD ALSO BE INCLUDED AS PART OF THE MONITORING PLAN. IN ADDITION, EPA WOULD CONDUCT 5 YEAR REVIEWS OF THE SITE AS CERCLA REQUIRES IN ORDER TO ENSURE THAT PUBLIC HEALTH AND THE ENVIRONMENT WERE ADEQUATELY PROTECTED.

#### **#SCAA**

#### **SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES**

THE SELECTED REMEDY FOR THE FIRST OPERABLE UNIT AT THE SITE IS A COMBINATION OF SC-3B (IN SITU VACUUM EXTRACTION OF GENERAL SITE AREA AND NON-PESTICIDE "HOT SPOTS"/ EXCAVATION OF PESTICIDE "HOT SPOTS" WITH OFF-SITE TREATMENT AND DISPOSAL) AND MOM-3 (GROUNDWATER EXTRACTION/ AIR STRIPPING/CARBON ADSORPTION OF WATER EFFLUENT/THERMAL TREATMENT OF AIR EFFLUENT/REINJECTION OF TREATED EFFLUENT). BASED ON CURRENT INFORMATION, THIS COMBINATION OF ALTERNATIVES OFFERS THE BEST BALANCE AMONG THE NINE EVALUATION CRITERIA THAT EPA USES AS A MEANS OF EVALUATING REMEDIAL ACTIONS.

THIS SECTION PROVIDES A GLOSSARY OF THE NINE CRITERIA AND AN ANALYSIS, WITH RESPECT TO THESE CRITERIA, OF THE REMEDIAL ALTERNATIVES WHICH WERE EVALUATED FOR THE SITE.

#### **GLOSSARY OF EVALUATION CRITERIA**

- \* OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT ADDRESSES WHETHER A REMEDY PROVIDES ADEQUATE PROTECTION AND DESCRIBES HOW RISKS ARE ELIMINATED, REDUCED, OR CONTROLLED THROUGH TREATMENT, ENGINEERING CONTROLS, OR INSTITUTIONAL CONTROLS.
- \* COMPLIANCE WITH ARARS ADDRESSES WHETHER A REMEDY WILL MEET ALL OF THE APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARS) AND/OR PROVIDE GROUNDS FOR INVOKING A WAIVER OF ARARS.
- \* SHORT-TERM EFFECTIVENESS ADDRESSES THE PERIOD OF TIME NEEDED TO ACHIEVE PROTECTION AGAINST ANY ADVERSE IMPACTS ON HUMAN HEALTH AND THE ENVIRONMENT THAT A SITE MAY POSE DURING THE CONSTRUCTION AND IMPLEMENTATION PERIOD OF AN ALTERNATIVE.
- \* LONG-TERM EFFECTIVENESS AND PERMANENCE REFERS TO THE ABILITY OF A REMEDY TO MAINTAIN RELIABLE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT OVER TIME ONCE CLEANUP GOALS HAVE BEEN MET. IT ALSO ADDRESSES THE MAGNITUDE AND EFFECTIVENESS OF THE MEASURES THAT MAY BE REQUIRED TO MANAGE THE RISKS POSED BY TREATMENT RESIDUALS AND/OR UNTREATED WASTES.
- \* REDUCTION OF TOXICITY, MOBILITY, OR VOLUME REFERS TO THE ANTICIPATED PERFORMANCE OF THE TREATMENT TECHNOLOGIES WITH RESPECT TO THESE PARAMETERS.
- \* IMPLEMENTABILITY INVOLVES THE TECHNICAL AND ADMINISTRATIVE FEASIBILITY OF A REMEDY, INCLUDING THE AVAILABILITY OF MATERIALS AND SERVICES NEEDED TO IMPLEMENT THE CHOSEN SOLUTION.

- \* COST INVOLVES BOTH CAPITAL AND O AND M COSTS. COST COMPARISONS ARE MADE ON THE BASIS OF PRESENT WORTH VALUES, WHICH HAVE BOTH CAPITAL AND O AND M COSTS FACTORED IN.
- \* STATE ACCEPTANCE INDICATES WHETHER THE STATE CONCURS WITH, OPPOSES, OR HAS NO COMMENT ON THE PREFERRED ALTERNATIVE.
- \* COMMUNITY ACCEPTANCE INDICATES WHETHER THE COMMUNITY CONCURS WITH, OPPOSES, OR HAS NO COMMENT ON THE PREFERRED ALTERNATIVE.

## ANALYSIS

### ANALYSIS OF SOIL ALTERNATIVES

#### OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

ALTERNATIVE SC-1 (NO ACTION) WOULD ONLY OFFER MINIMAL PROTECTION OF HUMAN HEALTH THROUGH REDUCTION OF THE PRESENT DIRECT CONTACT THREAT BY FURTHER LIMITING SITE ACCESS. THE RELATED BENEFITS ARE MINIMAL SINCE THE SITE ALREADY HAS AN EFFECTIVE LEVEL OF RESTRICTED ACCESS. RELATIVE TO THE ENVIRONMENT, THIS ALTERNATIVE WOULD NOT PROVIDE ANY INCREASED PROTECTION TO FLORA AND FAUNA OVER THE PRESENT BASELINE CONDITION. GIVEN THE PRESENT RISK LEVELS AT THE SITE AND THE LEVEL OF RISK REDUCTION AND ENVIRONMENTAL BENEFIT EXPECTED FROM THE IMPLEMENTATION OF EACH ALTERNATIVE, EPA CONSIDERS ALL OF THE ALTERNATIVES FOR SOURCE CONTROL, EXCEPT FOR THE NO ACTION ALTERNATIVE, TO BE SUFFICIENTLY PROTECTIVE OF HUMAN HEALTH AND THE ENVIRONMENT. THE NO ACTION ALTERNATIVE IS THEREFORE UNACCEPTABLE, AND IS ELIMINATED FROM FURTHER ANALYSIS. EACH OF THE ALTERNATIVES (EXCEPT NO ACTION) UTILIZES TREATMENT TO ELIMINATE THE PRINCIPAL THREAT POSED BY THE SITE SOILS. SC-3A AND B, AND SC-5 WOULD PROVIDE THE HIGHEST DEGREE OF PROTECTIVENESS, WHILE SC-3C WOULD PROVIDE LESS, BUT ADEQUATE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT.

#### COMPLIANCE WITH ARARS

THE TECHNOLOGIES PROPOSED FOR USE IN ALTERNATIVES SC-3A, B, AND C, AS WELL AS SC-5 WOULD BE DESIGNED AND IMPLEMENTED TO MEET ALL ARARS. FEDERAL AND STATE REGULATIONS DEALING WITH THE HANDLING AND TRANSPORTATION OF HAZARDOUS WASTES TO AN OFF-SITE TREATMENT FACILITY WOULD BE FOLLOWED. ALTERNATIVES SC-3A AND B WOULD REQUIRE CONSIDERATION OF LDRS SINCE EACH WOULD REQUIRE OFF-SITE TREATMENT OF SOILS. THE RESPONSIBILITY FOR MEETING APPLICABLE LDRS WOULD REST WITH THE OFF-SITE TREATMENT AND DISPOSAL FACILITY. ALTERNATIVE SC-3C WOULD NOT REQUIRE CONSIDERATION OF LDRS SINCE NO EXCAVATION AND PLACEMENT OF HAZARDOUS SUBSTANCES WOULD OCCUR DURING IMPLEMENTATION. ALTERNATIVE SC-5 IS EXPECTED TO MEET APPLICABLE LDRS. LIKEWISE, ALTERNATIVE SC-5 IS EXPECTED TO MEET APPROPRIATE CLOSURE REQUIREMENTS BY ACHIEVING "HYBRID" CLEAN CLOSURE, WHICH IS A COMBINATION OF CLOSURE CONSIDERATIONS AND REQUIREMENTS TAKEN FROM BOTH THE RCRA AND CERCLA PROGRAMS. HYBRID CLEAN CLOSURE IS ACHIEVED WHEN THE TREATED MATRIX (SOIL, IN THIS CASE) TO BE LAND DISPOSED WILL NOT POSE A DIRECT CONTACT THREAT, NOR WILL GROUNDWATER BE ADVERSELY AFFECTED BY LEACHATE FROM THE TREATED MATRIX.

#### SHORT-TERM EFFECTIVENESS

ALTERNATIVES SC-3A, B, AND C WOULD ALL REQUIRE APPROXIMATELY 3 YEARS TO DESIGN AND CONSTRUCT, WHILE SC-5 WOULD TAKE BETWEEN TWO AND THREE YEARS TO DESIGN AND CONSTRUCT. ONCE CONSTRUCTED, ALTERNATIVES SC-3A AND B WOULD REDUCE RISKS ASSOCIATED WITH CONTAMINATED SOIL MOST RAPIDLY SINCE THEY INVOLVE LIMITED EXCAVATION AND OFFSITE DISPOSAL OF THE HIGH RISK AREAS OF CONTAMINATION. ONCE CONSTRUCTED, SC-3A WOULD TAKE APPROXIMATELY 2.5 YEARS TO EFFECTIVELY REDUCE THE LEVELS OF SOIL CONTAMINANTS TO THE TARGET LEVELS (RELATED EXCAVATION UNDER SC-3A WOULD BE ACCOMPLISHED RELATIVELY QUICKLY AND, IN ANY EVENT, WELL BEFORE THE IN SITU TREATMENT IS COMPLETED). THE SC-3B, SC-3C AND SC-5 ALTERNATIVES WOULD REQUIRE A SLIGHTLY LONGER TIME, APPROXIMATELY 3 YEARS, TO COMPLETE TREATMENT AFTER BEING CONSTRUCTED. TREATMENT-RELATED IMPACTS WOULD LIKELY BE THE GREATEST FOR ALTERNATIVE SC-5 SINCE IT REQUIRES THE LARGEST AMOUNT OF CONTAMINATED SOIL EXCAVATION AND BECAUSE IT INVOLVES ON-SITE THERMAL TREATMENT OF ALL CONTAMINATED SOILS PRIOR TO REPLACEMENT ON-SITE. TREATMENT-RELATED IMPACTS FOR THE SC-3 ALTERNATIVES INVOLVING IN SITU VAPOR EXTRACTION WOULD BE MINIMAL. SHORT-TERM IMPACTS FOR EXCAVATION UNDER SC-3A AND B WOULD BE A CONCERN MAINLY FOR SITE WORKERS, BUT SUCH CONCERNS SHOULD BE MINIMIZED THROUGH DEVELOPMENT AND ADHERENCE TO APPROPRIATE HEALTH AND SAFETY PROTOCOLS.

## LONG-TERM EFFECTIVENESS AND PERMANENCE

ALL OF THE SOIL ALTERNATIVES INVOLVE TREATMENT TECHNOLOGIES THAT HAVE BEEN UTILIZED PREVIOUSLY AT OTHER SUPERFUND SITES, I.E., IN SITU VACUUM EXTRACTION, LOW TEMPERATURE THERMAL TREATMENT, AND EXCAVATION WITH OFF-SITE TREATMENT AND DISPOSAL. BASED ON THE DEMONSTRATED EFFECTIVENESS OF THESE TECHNOLOGIES AT OTHER SITES, ALL OF THE SC-3 ALTERNATIVES, AS WELL AS THE SC-5 ALTERNATIVE, SHOULD RESULT IN PERMANENT RISK REDUCTION SO THAT RISKS ASSOCIATED WITH REMEDIATED SOILS ARE WITHIN EPA'S ACCEPTABLE RISK RANGE. THE SC-3 ALTERNATIVES WILL ACCOMPLISH THIS PRIMARILY THROUGH IN SITU VACUUM EXTRACTION, WITH ADDITIONAL REDUCTIONS OF RISK UNDER SC-3A AND B THROUGH THE EXCAVATION OF SOIL "HOT SPOTS". SC-3C WOULD ONLY ACHIEVE RISK REDUCTION TO  $1 \times 10^{-4}$ , WHICH IS THE LEVEL OF RISK PRESENTLY ASSOCIATED WITH THE PESTICIDE "HOT SPOTS" (NOT READILY TREATABLE VIA VACUUM EXTRACTION).

## REDUCTION OF TOXICITY, MOBILITY, OR VOLUME

ALL OF THE TREATMENT ALTERNATIVES UNDER CONSIDERATION WOULD REDUCE THE VOLUME AND CONCENTRATIONS OF SOIL CONTAMINANTS TO HEALTH-BASED RESIDUAL LEVELS. THIS IN TURN WOULD ELIMINATE THE NON-CARCINOGENIC TOXICITY OF SITE CONTAMINANTS WHILE REDUCING CARCINOGENIC RISK FACTORS TO WITHIN THE EPA-ACCEPTABLE RISK RANGE. THE MOBILITY OF RESIDUAL SITE CONTAMINANTS WOULD BE UNAFFECTED, AS NONE OF THE ALTERNATIVES UNDER CONSIDERATION RELY ON CONTAINMENT TECHNOLOGY.

## IMPLEMENTABILITY

EPA BELIEVES THAT ALL OF THE SOIL ALTERNATIVES PRESENTLY UNDER CONSIDERATION ARE IMPLEMENTABLE IN TERMS OF THE MATERIALS AND SERVICES THAT WOULD BE NEEDED, AS WELL AS FROM THE STANDPOINT OF ADMINISTRATIVE REQUIREMENTS OR RESTRICTIONS THAT PRESENTLY EXIST. ALTERNATIVES SC-3A, B, AND C WOULD REQUIRE THE PERFORMANCE OF TREATABILITY STUDIES FOR THE IN SITU VACUUM EXTRACTION TECHNOLOGY IN ORDER TO DETERMINE ESSENTIAL DESIGN PARAMETERS.

## COST

THE RELATIVE PRESENT WORTH COSTS OF THE SOIL REMEDIATION ALTERNATIVES ARE GIVEN BELOW:

| ALTERNATIVE | CAPITAL COST | O&M COST    | PRESENT WORTH COST |
|-------------|--------------|-------------|--------------------|
| SC-3A       | \$17,896,733 | \$73,699    | \$18,097,415       |
| SC-3B       | \$3,227,566  | \$100,138   | \$3,500,242        |
| SC-3C       | \$2,731,392  | \$100,138   | \$3,004,068        |
| SC-5        | \$8,378,012  | \$1,089,526 | \$11,344,791       |

AS CAN BE SEEN FROM THE TABLE, ALTERNATIVE SC-3A IS SIGNIFICANTLY MORE EXPENSIVE THAN THE OTHER SOURCE REMEDIATION ALTERNATIVES, WHILE ALTERNATIVE SC-3C IS THE LEAST EXPENSIVE ALTERNATIVE IN TERMS OF PRESENT WORTH COSTS.

## STATE ACCEPTANCE

THE STATE OF NEW YORK HAS REVIEWED AND CONCURS WITH THE SELECTED REMEDY (SEE STATE LETTER OF CONCURRENCE - APPENDIX 3).

## COMMUNITY ACCEPTANCE

EPA CONCLUDES THAT THE SELECTED REMEDY HAS THE SUPPORT OF THE AFFECTED COMMUNITY BASED ON THE COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD, INCLUDING THOSE COMMENTS RECEIVED DURING THE PUBLIC MEETING HELD ON MAY 30, 1991.

## ANALYSIS OF WATER ALTERNATIVES

## OVERALL PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

ALTERNATIVE MOM-1, OR NO ACTION (MONITORING ONLY), PROVIDES NO INCREASE IN PROTECTION FOR EITHER PUBLIC HEALTH OR THE ENVIRONMENT. GIVEN THE HIGH DEGREE OF FUTURE RISK POSED BY INGESTION OF AND DERMAL CONTACT WITH CONTAMINATED GROUNDWATER, TOGETHER WITH THE UNCERTAINTY OF THE LEGISLATIVE FEASIBILITY AND LONG-TERM EFFECTIVENESS OF INSTITUTIONAL CONTROLS (LOCAL OR STATE RESTRICTIONS ON ACCESS TO GROUNDWATER IN THE AREA OF CONTAMINATION), EPA BELIEVES THAT THE NO ACTION ALTERNATIVE CANNOT ASSURE LONG-TERM PROTECTION OF PUBLIC HEALTH. SELECTION OF THE NO ACTION ALTERNATIVE WOULD ALSO HAVE NO EFFECT ON MITIGATING PRESENTLY UNQUANTIFIED IMPACTS OCCURRING IN THE WATERS OF GLEN COVE CREEK AND HEMPSTEAD HARBOR, AND TO A LESSER EXTENT, LONG ISLAND SOUND, AS A RESULT OF THE GROUNDWATER CONTAMINATION FROM THE SITE. THE NO ACTION ALTERNATIVE IS THEREFORE UNACCEPTABLE, AND IT HAS BEEN ELIMINATED FROM FURTHER ANALYSIS. ALTERNATIVES MOM-3 AND MOM-6 BOTH INVOLVE EXTRACTION AND TREATMENT OF THE GROUNDWATER PLUME. THE ALTERNATIVES VARY IN THE TYPES OF TREATMENT EMPLOYED AFTER EXTRACTION; HOWEVER, THE TREATMENTS EMPLOYED UNDER EACH ALTERNATIVE WOULD RESULT IN AIR/WATER EFFLUENTS THAT MEET APPLICABLE DISCHARGE OR EMISSION STANDARDS. FURTHER, BOTH OF THESE ALTERNATIVES WOULD BE SIMILARLY EFFECTIVE IN PROTECTING HUMAN HEALTH AND THE ENVIRONMENT BY PREVENTING OFF-SITE MIGRATION OF CONTAMINATED GROUNDWATER AS WELL AS BY REDUCING FUTURE RISKS POSED BY INGESTION OF AND DERMAL CONTACT WITH GROUNDWATER CONTAMINATION EMANATING FROM THE SITE.

#### COMPLIANCE WITH ARARS

ALTERNATIVES MOM-3 AND MOM-6 SHOULD BOTH EVENTUALLY MEET POTABLE WATER ARARS (PRIMARILY 10 NYCRR PART 5 REGULATIONS) AS A RESULT OF THE ACCELERATED PUMPING AND TREATMENT ACTIVITY COMMON TO THESE ALTERNATIVES, AS WELL AS THE CLEANUP OF CONTAMINATED SOILS WHICH HAVE DIRECTLY CONTRIBUTED TO THE GROUNDWATER CONTAMINATION. HOWEVER, GROUNDWATER CONTAMINATION MAY BE ESPECIALLY PERSISTENT IN THE IMMEDIATE VICINITY OF THE CONTAMINANTS' SOURCE, WHERE CONCENTRATIONS ARE VERY HIGH. ALSO, THE ABILITY TO MEET POTABLE WATER ARARS WITHIN THE SITE'S PLUME, OR AREA OF ATTAINMENT, MAY ALSO BE HINDERED BY THE PHENOMENON OF LOW CONCENTRATION ADSORPTION, WHICH OCCURS DURING EXTENDED PUMPING OF CONTAMINATED GROUNDWATER. THIS PHENOMENON HAS BEEN EXPERIENCED DURING OTHER SUPERFUND GROUNDWATER PUMP-AND-TREAT REMEDIAL ACTIONS, AS WELL AS DOCUMENTED EMPIRICALLY IN BENCH AND PILOT SCALE STUDIES. IN ADDITION, IT IS IMPORTANT TO NOTE THAT THE ACTUAL ATTAINMENT OF GROUNDWATER ARARS MAY BE FURTHER RESTRICTED BECAUSE OF THE EXISTENCE OF OTHER AREAS OF GROUNDWATER CONTAMINATION IN GARVEY'S POINT WHICH MAY EVENTUALLY COMMINGLE WITH THE MATTIACE PLUME. THEREFORE, THE CERTAINTY OF ACHIEVING CLEANUP GOALS AT ALL POINTS THROUGHOUT THE PLUME MAY ONLY BE KNOWN AFTER IMPLEMENTATION AND OPERATION OF THE PUMPING AND TREATMENT ACTIVITY FOR A PERIOD OF TIME SUFFICIENT TO ASCERTAIN CLEANUP EFFECTIVENESS.

#### SHORT-TERM EFFECTIVENESS

BOTH THE MOM-3 AND THE MOM-6 GROUNDWATER ALTERNATIVES WOULD TAKE APPROXIMATELY 2 YEARS TO DESIGN AND CONSTRUCT. IN THE SHORT-TERM, REMOVAL OF THE "FLOATING PRODUCT" LAYER, AS WELL AS THE SIGNIFICANT REMOVAL OF CONTAMINATION FROM GROUNDWATER EXPECTED INITIALLY UPON IMPLEMENTATION OF EITHER OF THE MOM ALTERNATIVES SHOULD RESULT IN A DRAMATIC IMPROVEMENT IN GROUNDWATER QUALITY OVER ITS CURRENTLY DEGRADED STATE.

SHORT-TERM IMPACTS ASSOCIATED WITH CONSTRUCTION AND OPERATION OF THE VARIOUS GROUNDWATER TREATMENT ALTERNATIVES SHOULD BE MINOR AND EASILY MINIMIZED THROUGH APPROPRIATE HEALTH AND SAFETY PROTOCOLS DURING CONSTRUCTION, AS WELL AS DILIGENT OPERATION AND MAINTENANCE PRACTICES ONCE EITHER OF THE MOM-3 OR THE MOM-6 ALTERNATIVES IS OPERATIONAL.

#### LONG-TERM EFFECTIVENESS AND PERMANENCE

BOTH THE MOM-3 AND THE MOM-6 GROUNDWATER ALTERNATIVES WOULD INVOLVE TREATMENT TECHNOLOGIES, I.E. GROUNDWATER AND FREE PRODUCT PUMPAGE, AIR STRIPPING, CARBON ADSORPTION, THERMAL TREATMENT, UV/PEROXIDE OXIDATION, ETC. THAT HAVE BEEN UTILIZED PREVIOUSLY AT OTHER SUPERFUND SITES. BASED ON THE DEMONSTRATED EFFECTIVENESS OF THESE TECHNOLOGIES AT OTHER SITES, THESE ALTERNATIVES SHOULD RESULT IN PERMANENT, LONG-TERM EFFECTIVENESS AFTER THE TARGET REDUCTIONS OF GROUNDWATER CONTAMINATION HAVE BEEN REACHED. PRELIMINARY GROUNDWATER MODELLING INDICATES THAT THE TIME NEEDED TO RESTORE THE GROUNDWATER DEGRADED AS A RESULT OF THE SITE TO ITS PREVIOUS MOST BENEFICIAL USE, I.E. A POTENTIAL POTABLE WATER SOURCE, IS APPROXIMATELY 30 YEARS. HOWEVER, THIS ESTIMATE SHOULD BE QUALIFIED BY THE DISCUSSION UNDER COMPLIANCE WITH ARARS ABOVE. SINCE BOTH THE MOM-3 AND THE MOM-6 ALTERNATIVES RELY ON AN OPTIMIZED EXTRACTION AND DISCHARGE SCENARIO, THIS ESTIMATE IS THE SAME FOR BOTH ALTERNATIVES.



## REDUCTION OF TOXICITY, MOBILITY, OR VOLUME

BOTH THE MOM-3 AND THE MOM-6 GROUNDWATER ALTERNATIVES WOULD SIGNIFICANTLY REDUCE THE VOLUME AND CONCENTRATIONS OF CONTAMINANTS IN THE GROUNDWATER PLUME. IN ADDITION, MOBILITY OF THE GROUNDWATER PLUME WOULD BE DRASTICALLY REDUCED AND PERHAPS ELIMINATED. THEREFORE, BOTH OF THE GROUNDWATER TREATMENT ALTERNATIVES WOULD ELIMINATE THE FUTURE RISKS ASSOCIATED WITH NON-CARCINOGENIC TOXICITY OF SITE CONTAMINANTS WHILE REDUCING THE CARCINOGENIC RISK TO ACCEPTABLE LEVELS THROUGH THE ATTAINMENT OF ARARS. LOW CONCENTRATION SOIL/CONTAMINANT BINDING MAY OCCUR DURING EXTENDED PUMPING OF GROUNDWATER SUCH THAT GROUNDWATER ARARS ARE DIFFICULT OR IMPOSSIBLE TO ACHIEVE AT THE POINT OF COMPLIANCE. HOWEVER, THESE ARARS CORRESPOND TO A VERY LOW RISK LEVEL; THEREFORE, IF SUCH A FAILURE TO OBTAIN THESE REQUIREMENTS THROUGH GROUNDWATER TREATMENT WERE TO OCCUR, IT IS NEVERTHELESS LIKELY THAT EITHER ALTERNATIVE WOULD RESULT IN THE REDUCTION OF THE FUTURE RISK ASSOCIATED WITH INGESTION AND DERMAL CONTACT TO WITHIN EPA'S ACCEPTABLE RISK RANGE.

## IMPLEMENTABILITY

EPA BELIEVES THAT BOTH OF THE GROUNDWATER ALTERNATIVES PRESENTLY UNDER CONSIDERATION ARE IMPLEMENTABLE IN TERMS OF THE MATERIALS AND SERVICES THAT WOULD BE NEEDED, AS WELL AS FROM THE STANDPOINT OF ADMINISTRATIVE REQUIREMENTS OR RESTRICTIONS THAT PRESENTLY EXIST.

## COST

THE RELATIVE COSTS OF THE GROUNDWATER REMEDIATION ALTERNATIVES ARE GIVEN BELOW:

| ALTERNATIVE | CAPITAL COST | O&M COST    | PRESENT WORTH COST |
|-------------|--------------|-------------|--------------------|
| MOM-3       | \$3,316,921  | \$592,859   | \$12,430,350       |
| MOM-6       | \$5,663,820  | \$1,597,227 | \$30,216,393       |

AS CAN BE SEEN FROM THE TABLE, ALTERNATIVE MOM-3 HAS A SIGNIFICANTLY LOWER PRESENT WORTH COST THAN ALTERNATIVE MOM-6.

## STATE ACCEPTANCE

THE STATE OF NEW YORK HAS REVIEWED AND CONCURS WITH THE SELECTED REMEDY (SEE STATE LETTER OF CONCURRENCE - APPENDIX 3).

## COMMUNITY ACCEPTANCE

EPA CONCLUDES THAT THE SELECTED REMEDY HAS THE SUPPORT OF THE AFFECTED COMMUNITY BASED ON THE COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD, INCLUDING THOSE COMMENTS RECEIVED DURING THE PUBLIC MEETING HELD ON MAY 30, 1991.

## #SR

### THE SELECTED REMEDY

#### GENERAL

THE SELECTED REMEDY FOR THE SITE IS A COMBINATION OF SC-3B (IN SITU VACUUM EXTRACTION OF GENERAL SITE AREA SOILS AND NON-PESTICIDE "HOT SPOTS"/EXCAVATION OF PESTICIDE "HOT SPOTS" WITH OFF-SITE TREATMENT AND DISPOSAL) AND MOM-3 (GROUNDWATER EXTRACTION/AIR STRIPPING/CARBON ADSORPTION OF WATER EFFLUENT/THERMAL TREATMENT OF AIR EFFLUENT/REINJECTION OF TREATED GROUNDWATER).

ANY HAZARDOUS NON-REGENERATIVE RESIDUALS RESULTING FROM ON-SITE TREATMENT WILL BE DISPOSED OFF-SITE IN ACCORDANCE WITH THE APPLICABLE/APPROPRIATE REQUIREMENTS OF RCRA AND STATE HAZARDOUS WASTE LAWS AND REGULATIONS.

THE ESTIMATED COST FOR THE SELECTED REMEDY IS:

|                     |              |
|---------------------|--------------|
| CAPITAL COST:       | \$6,544,487  |
| PRESENT WORTH COST: | \$15,930,592 |

A DETAILED DESCRIPTION OF COSTS ASSOCIATED WITH THE SELECTED REMEDY IS PRESENTED IN TABLE 5.

#### SOIL REMEDY

THE SOIL REMEDIATION ASPECT OF THE SELECTED REMEDY WILL INVOLVE IN SITU TREATMENT OF APPROXIMATELY 17,140 CY OF CONTAMINATED SOIL (INCLUDING NON-PESTICIDE "HOT SPOTS") BY MEANS OF VACUUM EXTRACTION, AND EXCAVATION OF APPROXIMATELY 208 CY OF SOIL (WHICH INCLUDES EXCAVATION SOIL EXPANSION FACTOR) CONTAMINATED PRIMARILY WITH PESTICIDES FOR OFF-SITE TREATMENT AND DISPOSAL, IN ACCORDANCE WITH APPLICABLE/APPROPRIATE REQUIREMENTS OF RCRA AND STATE HAZARDOUS WASTE LAWS AND REGULATIONS. FOR COSTING PURPOSES, OFF-SITE TREATMENT WAS ASSUMED TO BE INCINERATION, ALTHOUGH OTHER MORE INNOVATIVE TECHNOLOGY MAY BE EVENTUALLY SELECTED ON THE BASIS OF COST AND TREATMENT EQUIVALENCE.

THE IN SITU VACUUM EXTRACTION SYSTEM WILL BE OPERATED UNTIL SOIL CLEANUP LEVELS CORRESPONDING TO EPA'S TARGET RISK LEVEL OF  $1 \times 10^{-6}$  ARE ACHIEVED. THE SOIL CLEANUP LEVELS OF SELECTED INDICATOR CHEMICALS DETERMINED BY EPA TO CORRESPOND TO A  $1 \times 10^{-6}$  RISK LEVEL ARE GIVEN BELOW:

| CHEMICAL             | CLEANUP LEVEL<br>(MG/KG) |
|----------------------|--------------------------|
| VOLATILE ORGANICS    |                          |
| TETRACHLOROETHYLENE  | 0.6                      |
| TRICHLOROETHYLENE    | 0.07                     |
| 4-METHYL-2-PENTANONE | 52.1                     |
| XYLENE               | 259                      |

IN ADDITION, THE EXCAVATION OF THE PESTICIDE "HOT SPOTS" WILL BE INTENDED TO REDUCE RESIDUAL PESTICIDE CONTAMINATION TO THE FOLLOWING CLEANUP LEVELS WHICH CORRESPOND TO A  $1 \times 10^{-6}$  RISK LEVEL:

| CHEMICAL           | CLEANUP LEVEL<br>(MG/KG) |
|--------------------|--------------------------|
| PESTICIDES         |                          |
| ALDRIN             | 0.04                     |
| ALPHA CHLORDANE    | 0.5                      |
| HEPTACHLOR EPOXIDE | 0.07                     |

IN SITU VACUUM EXTRACTION OF CONTAMINATED SOILS WILL INVOLVE THE REMOVAL OF ORGANIC CONTAMINANTS FROM THE SOIL WITHOUT MAJOR SOIL DISTURBANCE, AND IS ACCOMPLISHED BY INSTALLING SOIL VAPOR EXTRACTION WELLS AT STRATEGIC POINTS, MANIFOLDING THE WELLS, AND APPLYING A VACUUM IN ORDER TO DRAW CONTAMINATED SOIL GASES OUT OF THE GROUND AND INTO A TREATMENT SYSTEM. FOR COSTING PURPOSES, EPA HAS ESTIMATED THAT 12 SUCH WELLS WILL BE NEEDED; HOWEVER, THE ACTUAL NUMBER AND SIZING OF THE WELLS WILL BE DETERMINED DURING THE DESIGN PHASE OF THIS PROJECT. THE TREATMENT SYSTEM FOR EXTRACTED SOIL GASES IS COMPRISED OF A VAPOR/LIQUID SEPARATOR AND AN ACTIVATED CARBON CANISTER FOR OFF-GAS EMISSION CONTROL, ALTHOUGH EQUIVALENT TECHNOLOGIES COULD BE UTILIZED. THE DETAILS OF THE EXTRACTED SOIL GAS TREATMENT SYSTEM WILL ALSO BE FINALIZED DURING DESIGN. IN ADDITION, TREATABILITY STUDIES WILL ALSO BE PERFORMED TO DETERMINE DESIGN PARAMETERS FOR THE VACUUM EXTRACTION SYSTEM (FIGURE 11).

EPA MAY ALSO INCLUDE THE USE OF THE VACUUM/TREATMENT TECHNOLOGY ON VOC-CONTAMINATED STOCKPILES OF SOIL FROM THE GENERAL SITE AREA (NOT THE AREA 1 DRUM BURIAL AREA, WHICH WILL BE EXCAVATED FOR OFF-SITE TREATMENT AND DISPOSAL IN ACCORDANCE WITH THE SECOND OPERABLE UNIT ROD). THESE STOCKPILES WILL BE A RESULT OF EPA'S REGRADING THE WESTERN PART OF THE SITE IN ORDER TO INCREASE THE STABILITY OF A RETAINING WALL, WHICH IS SCHEDULED TO OCCUR DURING THE SECOND OPERABLE UNIT REMEDIAL ACTION.

THE EXCAVATION OF SOILS FOR OFF-SITE TREATMENT AND DISPOSAL WILL INVOLVE EXCAVATION OF PESTICIDE-CONTAMINATED

"HOT SPOTS". APPROXIMATELY 208 CY OF SOILS ARE EXPECTED TO BE REMOVED FROM THE THREE AREAS THAT ARE CONTAMINATED WITH PESTICIDES.

CLEAN FILL WILL BE USED TO BACKFILL EXCAVATED AREAS. CONTAMINATED SURFACE RUNOFF ASSOCIATED WITH REMEDIAL ACTIVITY AT THE SITE, PARTICULARLY EXCAVATION OF THE PESTICIDE-CONTAMINATED AREAS, WILL BE CONTROLLED THROUGH THE USE OF COVERS, BERMS, ETC.

THE SELECTED REMEDY WILL ALSO INCLUDE THE DECONTAMINATION (AS NECESSARY), DEMOLITION, REMOVAL, AND LANDFILL DISPOSAL OF THE QUONSET HUT, 24 ABOVEGROUND STORAGE TANKS, 32 UNDERGROUND STORAGE TANKS, INCLUDING THE SOLVENT/STORMWATER SEPARATOR IN THE SOUTHEAST PART OF THE PROPERTY, AND 1,360 CY OF CONCRETE AND ASPHALT. CLEAN FILL WILL BE USED TO BACKFILL EXCAVATED TANK AREAS.

#### GROUNDWATER REMEDY

THE CONTAMINATED GROUNDWATER ASPECT OF THE SELECTED REMEDY WILL INCLUDE EXTRACTION AND INJECTION WELLS INSTALLED INTO THE CONTAMINATED GROUNDWATER PLUME. FOR COSTING PURPOSES, EPA ESTIMATES THAT 8 EXTRACTION WELLS WILL BE REQUIRED IN ORDER TO CAPTURE AND REMOVE THE PLUME OF CONTAMINATED GROUNDWATER. FIRST, APPROXIMATELY 15,000 GALLONS OF "FLOATING PRODUCT" BENEATH THE SITE WILL BE REMOVED THROUGH THE EXTRACTION WELLS WITH A SKIMMER PUMP, WITH SUBSEQUENT TRANSPORTATION OF THE EXTRACTED PRODUCT OFF-SITE FOR TREATMENT AND DISPOSAL. NEXT, APPROXIMATELY 20,000 GALLONS PER DAY OF THE CONTAMINATED GROUNDWATER PLUME WILL BE PUMPED OUT OF THE GROUND AND INTO AN EQUALIZATION TANK, PRETREATED VIA PRECIPITATION AND CLARIFICATION TO REMOVE IRON AND MANGANESE (THESE METALS WOULD INTERFERE WITH SUBSEQUENT TREATMENT), AND THEN TREATED ON-SITE BY MEANS OF AIR STRIPPING TECHNOLOGY TO REMOVE VOLATILE ORGANICS. THE AIR EFFLUENT FROM THE AIR STRIPPER WILL THEN BE THERMALLY TREATED PRIOR TO DISCHARGE IN ORDER TO MEET THE APPLICABLE/APPROPRIATE REQUIREMENTS OF THE CLEAN AIR ACT AND STATE LAWS AND REGULATIONS. THE WATER EFFLUENT FROM THE AIR STRIPPER WILL BE CARBON-TREATED IN ORDER TO REDUCE ANY REMAINING ORGANIC CONTAMINANTS TO LEVELS BELOW APPLICABLE/APPROPRIATE REQUIREMENTS OF THE SAFE DRINKING WATER ACT (MAXIMUM CONTAMINANT LEVELS, OR MCLS) AND STATE LAWS AND REGULATIONS (10 NYCRR PART 5).

AN EXAMPLE OF SOME OF THE ARARS FOR GROUNDWATER REMEDIATION AT THIS SITE ARE:

| CHEMICAL            | REQUIREMENT | REFERENCE              |
|---------------------|-------------|------------------------|
| TETRACHLOROETHYLENE | 5 UG/L      | 10 NYCRR PART 5        |
| TRICHLOROETHYLENE   | 5 UG/L      | 40 CFR PARTS 141 & 142 |
| ETHYLBENZENE        | 5 UG/L      | 10 NYCRR PART 5        |
| TOTAL XYLENES       | 5 UG/L      | 10 NYCRR PART 5        |
| METHYLENE CHLORIDE  | 5 UG/L      | 10 NYCRR PART 5        |
| O-DICHLOROBENZENE   | 5 UG/L      | 10 NYCRR PART 5        |

SPENT ACTIVATED CARBON WILL BE TRANSPORTED OFF-SITE AND REGENERATED FOR REUSE. THE TREATED WATER EFFLUENT WILL THEN BE REINJECTED INTO THE GROUND THROUGH GROUNDWATER REINJECTION WELLS (FOR COSTING PURPOSES, EPA ESTIMATES 4 REINJECTION WELLS). REINJECTION WILL TAKE PLACE HYDRAULICALLY UPGRADIENT OF THE EXTRACTION ZONE IN ORDER TO ACCELERATE THE RATE OF GROUNDWATER TREATMENT. ACTUAL SPATIAL AND DEPTH LOCATIONS OF EXTRACTION AND REINJECTION WELLS WILL BE DETERMINED FROM ADDITIONAL GROUNDWATER MONITORING TO BE CONDUCTED DURING THE DESIGN PHASE OF THE PROJECT (FIGURE 12). DURING THE DESIGN PHASE, EPA WILL ALSO CONSIDER AND ATTEMPT TO MITIGATE THE POSSIBLE IMPACT THAT LOCALIZED PUMPING AND REINJECTION MAY HAVE ON THE WETLAND VEGETATION ALONG THE CREEK AND IN GARVEY'S POINT PRESERVE, ALTHOUGH THE LIKELIHOOD OF SUCH IMPACT IS CONSIDERED REMOTE AT THE PRESENT TIME.

THE GOAL OF THE GROUNDWATER PORTION OF THE SELECTED REMEDY IS TO RESTORE GROUNDWATER UNDER THE SITE TO ITS MOST BENEFICIAL USE, WHICH IS AS A POTENTIAL SUPPLY OF POTABLE WATER. BASED ON INFORMATION OBTAINED DURING THE RI AND ON A CAREFUL ANALYSIS OF REMEDIAL ALTERNATIVES, EPA BELIEVES THAT THE SELECTED REMEDY WILL ACHIEVE THIS GOAL. IT MAY BECOME APPARENT, DURING IMPLEMENTATION OR OPERATION OF THE GROUNDWATER EXTRACTION SYSTEM, THAT CONTAMINANT LEVELS HAVE CEASED TO DECLINE AND ARE REMAINING CONSTANT AT LEVELS HIGHER THAN THE REMEDIATION GOAL OVER SOME PORTION OF THE CONTAMINATED PLUME. IN SUCH A CASE, THE SYSTEM PERFORMANCE STANDARDS AND/OR THE REMEDY MAY BE REEVALUATED.

THE SELECTED REMEDY WILL INCLUDE GROUNDWATER EXTRACTION FOR AN ESTIMATED PERIOD OF 30 YEARS, DURING WHICH THE SYSTEM'S PERFORMANCE WILL BE CAREFULLY MONITORED ON A REGULAR BASIS AND ADJUSTED AS WARRANTED BY THE PERFORMANCE DATA COLLECTED DURING OPERATION. MODIFICATIONS MAY INCLUDE ANY OR ALL OF THE FOLLOWING:

- \* DISCONTINUING PUMPING AT INDIVIDUAL WELLS WHERE CLEANUP GOALS HAVE BEEN ATTAINED
- \* ALTERNATING PUMPING AT WELLS TO ELIMINATE STAGNATION
- \* PULSE PUMPING TO ALLOW AQUIFER EQUILIBRATION AND TO ALLOW ADSORBED CONTAMINANTS TO PARTITION INTO GROUNDWATER
- \* INSTALLING ADDITIONAL EXTRACTION WELLS TO FACILITATE OR ACCELERATE CLEANUP OF THE CONTAMINANT PLUME

TABLE 6 PROVIDES A SUMMARY OF THE REMEDIATION GOALS FOR BOTH SOIL AND GROUNDWATER AT THE SITE.

#### MONITORING PROGRAM

THE SELECTED REMEDY INCLUDES BOTH A SHORT-TERM MONITORING PROGRAM, WHICH IS INTENDED TO ASSIST IN DESIGNING THE SELECTED REMEDY THROUGH ACQUISITION OF ADDITIONAL REMEDY-SPECIFIC INFORMATION, AND A LONG-TERM MONITORING PROGRAM FOR EVALUATION OF THE CLEANUP. ANCILLARY PROGRAMS FOR MONITORING WORKER SAFETY DURING REMEDY DESIGN AND CONSTRUCTION ARE STANDARD IN THE SUPERFUND PROGRAM AND DO NOT REQUIRE FURTHER ELABORATION.

THE SHORT-TERM MONITORING PROGRAM WILL INCLUDE THE FOLLOWING ELEMENTS:

- \* GROUNDWATER MONITORING TO FURTHER DEFINE LOCALIZED HYDROLOGIC GRADIENTS, AS WELL AS THE EXTENT OF THE SITE GROUNDWATER PLUME. THIS INFORMATION WILL ASSIST IN THE DESIGN OF THE GROUNDWATER EXTRACTION AND REINJECTION SYSTEM AND WILL LIKELY NECESSITATE THE CONSTRUCTION OF SEVERAL NEW MONITORING WELLS AT STRATEGIC LOCATIONS PREVIOUSLY IDENTIFIED DURING THE RI.
- \* RADIOLOGICAL MONITORING DURING ANY EXCAVATION ACTIVITIES AT THE SITE (AS A PRECAUTIONARY MEASURE DUE TO THE HISTORY OF LIMITED LANDFILLING OF RADIOLOGICAL MATERIALS IN THE NEARBY GARVEY'S POINT LANDFILL).
- \* TREATABILITY STUDIES FOR THE IN SITU VACUUM EXTRACTION SYSTEM, WHICH WILL LIKELY INVOLVE PILOT SCALE TESTING AND MONITORING TO ASCERTAIN DESIGN PARAMETERS THAT ARE ASSOCIATED WITH THE SOILS ON-SITE.
- \* SOIL GAS SURVEY OF THE PERIMETER OF THE MATTIACE PROPERTY AND BEYOND, AS NECESSARY, TO DETERMINE WHETHER APPRECIABLE AMOUNTS OF CONTAMINATED SOIL GAS ARE MIGRATING OFF-SITE IN THE VADOSE ZONE.
- \* ADDITIONAL SAMPLING OF SOIL AND SEDIMENT ALONG THE SURFACE RUNOFF PATHWAY FROM THE MATTIACE PROPERTY TO GLEN COVE CREEK, INCLUDING THE SEDIMENTS, IF ANY, IN THE STORM SEWER WHICH DISCHARGES TO THE CREEK.

THE SELECTED REMEDY ALSO INCLUDES THE FOLLOWING LONG-TERM MONITORING PROVISIONS:

- \* A SOIL SAMPLING PROGRAM UTILIZING SOIL BORINGS AS NEEDED TO ASCERTAIN THE PROGRESS OF THE IN SITU VACUUM EXTRACTION SOIL CLEANUP. SOIL SAMPLES WILL BE ANALYZED FOR, AT A MINIMUM, THOSE ORGANIC COMPOUNDS FOR WHICH ACTION LEVELS HAVE BEEN SPECIFIED AS PART OF THE SELECTED REMEDY. THIS PROGRAM WILL BE MORE FULLY DEVELOPED DURING THE CONSTRUCTION OF THE IN SITU VACUUM EXTRACTION SYSTEM.
- \* A SEMI-ANNUAL GROUNDWATER MONITORING PROGRAM TO ASCERTAIN THE PROGRESS OF THE PUMPING AND TREATMENT OF GROUNDWATER. GROUNDWATER SAMPLES WILL BE ANALYZED FOR, AT A MINIMUM, THE

CONTAMINANTS OF CONCERN IDENTIFIED IN THE RISK ASSESSMENT CONTAINED IN THE RISK ASSESSMENT FOR THE SITE. THIS PROGRAM WILL BE MORE FULLY DEVELOPED DURING THE CONSTRUCTION OF THE GROUNDWATER PUMPING AND TREATMENT SYSTEM.

- \* AN ANNUAL SAMPLING PROGRAM OF GLEN COVE CREEK SEDIMENT AND WATER COLUMN TO DETERMINE ANY INCREASE OR DECREASE IN THE LEVELS OF CONTAMINANTS IN BOTH MEDIA. SAMPLES WILL BE TAKEN IN THE THREE LOCATIONS THAT WERE SAMPLED DURING THE FIRST OPERABLE UNIT RI, AND SAMPLES WILL BE ANALYZED FOR, AT A MINIMUM, THE CONTAMINANTS OF CONCERN IDENTIFIED IN THE RISK ASSESSMENT FOR THE SITE.

AS REQUIRED BY CERCLA, EPA WILL ALSO CONDUCT FIVE YEAR REVIEWS OF THE SITE IN ORDER TO ENSURE THAT PUBLIC HEALTH AND THE ENVIRONMENT ARE ADEQUATELY PROTECTED.

DURING THE PERFORMANCE OF LONG-TERM MONITORING, EPA MAY DETERMINE THAT A REMEDIAL ACTION OBJECTIVE HAS BEEN MET. AT THAT POINT, EPA MAY TERMINATE ANY MONITORING PROGRAMS ASSOCIATED WITH THAT OBJECTIVE. FOR THE LONG-TERM GROUNDWATER MONITORING PROGRAM, HOWEVER, EPA WILL CONTINUE TO MONITOR ON A SEMI-ANNUAL BASIS FOR AT LEAST ONE YEAR AFTER CLEANUP LEVELS ARE ACHIEVED AND GROUNDWATER EXTRACTION/TREATMENT HAS CEASED IN ORDER TO ENSURE THAT CLEANUP LEVELS ARE MAINTAINED. UPON MEETING ALL REMEDIAL OBJECTIVES, OR DETERMINING THAT THE SITE HAS BEEN SUFFICIENTLY PURGED OF CONTAMINANTS SO THAT PUBLIC HEALTH IS NO LONGER THREATENED BY EXPOSURE TO THE SITE, EPA WILL INITIATE PROCEEDINGS TO DELETE THE SITE FROM THE NATIONAL PRIORITIES LIST.

#### #SD

#### STATUTORY DETERMINATIONS

UNDER ITS LEGAL AUTHORITIES, EPA'S PRIMARY RESPONSIBILITY AT SUPERFUND SITES IS TO UNDERTAKE REMEDIAL ACTIONS THAT ACHIEVE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT. IN ADDITION, SECTION 121 OF CERCLA ESTABLISHES SEVERAL OTHER STATUTORY REQUIREMENTS AND PREFERENCES. THESE SPECIFY THAT, WHEN COMPLETE, THE SELECTED REMEDIAL ACTION FOR A SITE MUST COMPLY WITH APPLICABLE OR RELEVANT AND APPROPRIATE ENVIRONMENTAL STANDARDS ESTABLISHED UNDER FEDERAL AND STATE ENVIRONMENTAL LAWS UNLESS A STATUTORY WAIVER IS JUSTIFIED. A SELECTED REMEDY ALSO MUST BE COST EFFECTIVE AND UTILIZE PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES OR RESOURCE RECOVERY TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE. FINALLY, THE STATUTE INCLUDES A PREFERENCE FOR REMEDIES THAT EMPLOY TREATMENT THAT PERMANENTLY AND SIGNIFICANTLY REDUCE THE VOLUME, TOXICITY, OR MOBILITY OF HAZARDOUS WASTES AS THEIR PRINCIPAL ELEMENT.

#### PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

THE SELECTED REMEDY WILL RESULT IN THE REDUCTION OF SOIL CONTAMINANTS AT THE SITE TO HEALTH-BASED CLEANUP LEVELS THROUGH THE USE OF IN SITU VACUUM EXTRACTION AND THE EXCAVATION AND REMOVAL OF THREE PESTICIDE "HOT SPOTS" NOT AMENABLE TO THE VACUUM EXTRACTION TECHNOLOGY. THE SELECTED REMEDY WILL ALSO PROVIDE FOR THE CLEANUP OF CONTAMINATED GROUNDWATER BENEATH THE SITE (INCLUDING REMOVAL OF THE CONCENTRATED "FLOATING PRODUCT" LAYER) TO EXISTING ARARS, WHICH ARE INTENDED TO PROTECT HUMAN HEALTH BY ASSURING THE QUALITY OF POTABLE WATER SUPPLIES. ALTHOUGH THE GROUNDWATER CONTAMINATED AT THIS SITE IS NOT PRESENTLY USED FOR POTABLE WATER BY THE COMMUNITY, ITS MOST BENEFICIAL USE ACCORDING TO A CLASSIFICATION MADE BY THE STATE OF NEW YORK IS AS POTABLE WATER. THEREFORE, EPA BELIEVES THAT THE GROUNDWATER REMEDY SELECTED SHOULD ADDRESS THE AQUIFER'S POTENTIAL USE AS POTABLE WATER. IN ADDITION, ALL EXISTING ABOVE- AND BELOW-GROUND STORAGE TANKS WILL BE DECONTAMINATED AND REMOVED OFF-SITE, THEREBY ELIMINATING ANY THREATS POSED BY RESIDUAL CONTAMINATION STILL RESIDING IN THE TANKS. ALTHOUGH SOME RISKS MAY BE POSED TO SITE WORKERS DURING EXCAVATION AND HAZARDOUS WASTE/RESIDUALS HANDLING, THESE RISKS CAN BE EASILY MITIGATED THROUGH IMPLEMENTATION OF APPROPRIATE HEALTH AND SAFETY PRECAUTIONS.

#### COMPLIANCE WITH APPLICABLE OR APPROPRIATE AND RELEVANT STANDARDS

THE SELECTED REMEDY FOR SOURCE CONTROL (SC-3B: IN SITU VACUUM EXTRACTION OF GENERAL SITE AREA AND NON-PESTICIDE "HOT SPOTS"/ EXCAVATION OF PESTICIDE "HOT SPOTS" WITH OFF-SITE TREATMENT AND DISPOSAL) IS EXPECTED TO COMPLY WITH ALL ARARS. ANY OFF-SITE FACILITY USED FOR TREATMENT AND DISPOSAL WILL BE FULLY RCRA-PERMITTED AND WILL BE IN COMPLIANCE WITH THE TERMS OF THE PERMIT. ANY CONTAMINATED SOIL, DEBRIS, OR SEDIMENTS FROM THE SITE WILL BE TREATED USING SPECIFIC TECHNOLOGIES OR SPECIFIC TREATMENT LEVELS, AS

APPROPRIATE, TO COMPLY WITH LDRS. ANY RESIDUALS FROM THE TREATMENT PROCESSES THAT ARE NON-REGENERATIVE WILL BE TREATED AND DISPOSED OF IN COMPLIANCE WITH LDRS.

THE SELECTED GROUNDWATER REMEDY MOM-3 (GROUNDWATER EXTRACTION/ AIR STRIPPING/ CARBON ADSORPTION OF WATER EFFLUENT/THERMAL TREATMENT OF AIR EFFLUENT/ REINJECTION OF TREATED GROUNDWATER) IS EXPECTED TO COMPLY WITH THE ASSOCIATED ARARS OVER TIME. IT MAY BECOME APPARENT, DURING IMPLEMENTATION OR OPERATION OF THE GROUNDWATER EXTRACTION SYSTEM, THAT CONTAMINANT LEVELS HAVE CEASED TO DECLINE AND ARE REMAINING CONSTANT AT LEVELS HIGHER THAN ARARS OVER SOME PORTION OF THE CONTAMINATED PLUME. IN SUCH A CASE, THE SYSTEM PERFORMANCE STANDARDS AND/OR THE REMEDY MAY BE REEVALUATED.

AT ITS COMPLETION, EPA INTENDS THAT THE SELECTED REMEDY WILL COMPLY WITH, AT A MINIMUM, THE FOLLOWING ARARS:

ACTION-SPECIFIC ARARS:

RCRA 40 CFR PART 262 - STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE

RCRA 40 CFR PART 264 - SUBPART F APPLICABLE TO GROUNDWATER MONITORING AT HAZARDOUS WASTE FACILITIES

SUBPART J APPLICABLE TO TREATMENT SYSTEMS AT HAZARDOUS WASTE FACILITIES

RCRA 40 CFR PART 268 - LAND DISPOSAL RESTRICTIONS ON REGULATED HAZARDOUS WASTE

6 NYCRR PART 372 - HAZARDOUS WASTE MANIFEST SYSTEM AND RELATED STANDARDS FOR GENERATORS, TRANSPORTERS AND FACILITIES

6 NYCRR SUBPART 373-2 - FINAL STATE STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES

6 NYCRR PARTS 200, 201, 212, AND 231 - NEW YORK STATE REGULATIONS FOR AIR EMISSIONS

CHEMICAL-SPECIFIC ARARS:

6 NYCRR 703 AND 10 NYCRR PART 5 - NEW YORK STATE GROUNDWATER QUALITY STANDARDS AND DRINKING WATER STANDARDS

40 CFR PARTS 141 AND 142 - FEDERAL DRINKING WATER STANDARDS

LOCATION-SPECIFIC ARARS:

US COASTAL ZONE MANAGEMENT ACT  
NATIONAL HISTORIC PRESERVATION ACT

COST EFFECTIVENESS

THE SELECTED REMEDY PROVIDES OVERALL EFFECTIVENESS PROPORTIONAL TO ITS COST. THE TOTAL CAPITAL AND PRESENT WORTH COSTS FOR THE SELECTED REMEDY ARE ESTIMATED TO BE \$6,544,487 AND \$15,930,592, RESPECTIVELY. THE SELECTED SOIL ALTERNATIVE, SC-3B, IS THE SECOND LEAST EXPENSIVE TREATMENT ALTERNATIVE. SC-3C IS SLIGHTLY LESS COSTLY TO IMPLEMENT; HOWEVER, THE CORRESPONDING REDUCTION IN PROTECTION OF PUBLIC HEALTH DOES NOT, IN EPA'S VIEW, WARRANT ITS SELECTION.

THE SELECTED GROUNDWATER ALTERNATIVE, MOM-3, IS THE LEAST EXPENSIVE TREATMENT ALTERNATIVE.

UTILIZATION OF PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES (OR RESOURCE RECOVERY TECHNOLOGIES) TO THE MAXIMUM EXTENT PRACTICABLE AND PREFERENCE FOR TREATMENT AS A PRINCIPAL ELEMENT

THE REMOVAL AND SUBSEQUENT PERMANENT TREATMENT OF SOIL AND GROUNDWATER CONTAMINANTS THROUGH THE TECHNOLOGIES

OF THE SELECTED REMEDY SATISFIES THE STATUTORY PREFERENCE OF CERCLA FOR UTILIZING PERMANENT SOLUTIONS AND ALTERNATIVE TREATMENT TECHNOLOGIES TO THE MAXIMUM EXTENT PRACTICABLE. THE SELECTED REMEDY WILL ALSO PERMANENTLY AND SIGNIFICANTLY REDUCE THE TOXICITY, MOBILITY, AND VOLUME OF HAZARDOUS SUBSTANCES IN BOTH THE SOIL AND GROUNDWATER AT THE SITE, THEREBY ELIMINATING ALL THE PRINCIPAL THREATS OF CONTAMINATION AT THE SITE.

#### **#DSC**

#### **DOCUMENTATION OF SIGNIFICANT CHANGES**

THE PROPOSED PLAN FOR THE SITE WAS RELEASED TO THE PUBLIC IN MAY 1991. THE PROPOSED PLAN IDENTIFIED A COMBINATION OF SC-3B AND MOM-3 AS THE PREFERRED ALTERNATIVE TO REMEDIATE THE SOURCE OF CONTAMINATION. EPA REVIEWED ALL COMMENTS SUBMITTED DURING THE PUBLIC COMMENT PERIOD. UPON REVIEW OF THESE COMMENTS, IT WAS DETERMINED THAT NO SIGNIFICANT CHANGES TO THE SELECTED REMEDY, AS IT WAS ORIGINALLY IDENTIFIED IN THE PROPOSED PLAN, WERE NECESSARY.

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TABLE 3  
MATTIACE PETROCHEMICAL SITE  
SELECTED CONSTITUENTS OF CONCERN

| METAL     | VOLATILES<br>IN AIR   | SEMI-VOLATILES      |
|-----------|-----------------------|---------------------|
| ANTIMONY  | 1,1,1-TRICHLOROETHANE | 1,2-DICHLOROBENZENE |
| ARSENIC   | 1,2-DICHLOROETHENE    | 1,4-DICHLOROBENZENE |
| BARIUM    | 1,2-DICHLOROETHANE    | 2-METHYLNAPHTHALENE |
| BERYLLIUM | 2-BUTANONE            | ALDRIN              |
| CADMIUM   | 4-METHYL-2-PENTANONE  | ALPHA CHLORDANE     |
| CHROMIUM  | ACETONE               | HEPTACHLOR EXPOXIDE |
| LEAD      | CARBON TETRACHLORIDE  | NAPHTHALENE         |
| MANGANESE | ETHYLBENZENE          |                     |
|           | METHYLENE CHLORIDE    |                     |
|           | TETRACHLOROETHENE     |                     |
|           | TOLUENE               |                     |
|           | TRICHLOROETHENE       |                     |
|           | XYLENES               |                     |
|           | IN SURFACE WATER      |                     |
| MANGANESE | BROMODICHLOROMETHANE  | NONE                |
| THALLIUM  | 1,1,2-DICHLOROETHENE  |                     |
|           | TETRACHLOROETHENE     |                     |
|           | IN SOIL               |                     |
| ANTIMONY  | 1,1,1-TRICHLOROETHANE | 1,2-DICHLOROBENZENE |
| ARSENIC   | 2-BUTANONE            | 1,4-DICHLOROBENZENE |
| BARIUM    | 1,1,2-DICHLOROETHENE  | 2-METHYLNAPHTHALENE |
| BERYLLIUM | CHLOROFORM            | ALDRIN              |
| CADMIUM   | ETHYLBENZENE          | ALPHA CHLORDANE     |
| CHROMIUM  | TETRACHLOROETHENE     | HEPTACHLOR EPOXIDE  |
| LEAD      | TOLUENE               | NAPHTHALENE         |
| MANGANESE | TRICHLOROETHENE       |                     |
|           | XYLENES               |                     |



IN GROUNDWATER - NORTH OF GW DIVIDE

|           |                      |                             |
|-----------|----------------------|-----------------------------|
| ARSENIC   | 1,2-DICHLOROETHANE   | 1,2-DICHLOROBENZENE         |
| BARIUM    | 2-BUTANONE           | ALDRIN                      |
| BERYLLIUM | CARBON TETRACHLORIDE | ALPHA CHLORDANE             |
| CADMIUM   | CHLOROFORM           | BIS(2-ETHYLHEXYL) PHTHALATE |
| CHROMIUM  | ETHYLBENZENE         | DI-N-BUTYLPHTHALATE         |
| MANGANESE | METHYLENE CHLORIDE   | HEPTACHLOR                  |
|           | TETRACHLOROETHENE    | ISOPHORONE                  |
|           | TRICHLOROETHENE      | NAPHTHALENE                 |
|           | VINYL CHLORIDE       | NAPHTHALENE                 |
|           | M&P-XYLENES          |                             |

IN GROUNDWATER -- SOUTH OF THE GW DIVIDE

|           |                       |                             |
|-----------|-----------------------|-----------------------------|
| ARSENIC   | 1,1,1-TRICHLOROETHANE | 1,2-DICHLOROBENZENE         |
| BARIUM    | 1,1-DICHLOROETHENE    | 2,4-DIMETHYLPHENOL          |
| CHROMIUM  | C-1,2-DICHLOROETHENE  | 4-METHYLPHENOL              |
| MANGANESE | 2-BUTANONE            | BIS(2-ETHYLHEXYL) PHTHALATE |
|           | ETHYLBENZENE          | DI-N-BUTYLPHTHALATE         |
|           | METHYLENE CHLORIDE    | NAPHTHALENE                 |
|           | NAPHTHALENE           |                             |
|           | VINYL CHLORIDE        |                             |
|           | M&P-XYLENES           |                             |
|           | O-XYLENES             |                             |

**TABLE 5**  
**SUMMARY OF COST ESTIMATE**  
**\*ALTERNATIVE SC-3B\***

| ELEMENT/ITEM                        | TOTAL COST  | DESCRIPTION  |
|-------------------------------------|-------------|--|
| I. GENERAL                          | \$32,856    | TREATABILITY STUDY,<br>TRAILER, STORAGE, PAVING                          |
| II. EXTRACTION WELL<br>CONSTRUCTION | \$31,850    | 10 8" WELLS (15 FT DEEP)   |
| III. VACUUM EXTRACTION SYSTEM       | \$53,288    | INSTRUMENTATION/ELECTRIC, PIPING,<br>BLOWER                              |
| IV. OFF-SITE DISPOSAL               | \$402,645   | 208 CY OF EXPANDED<br>PESTICIDE SOIL                                     |
| V. BACKFILL                         | \$4,054     |  |
| VI. CARBON ADSORPTION               | \$1,220,000 |  |
| VII. STRUCTURE REMOVAL              | \$108,000   | DEMOLITION/REMOVAL OF<br>QUONSET HUT, 1360 CY OF<br>CONCRETE AND ASPHALT |
| VIII. STORAGE TANK REMOVAL          | \$505,000   | DEMOLITION/REMOVAL OF<br>24 ABOVEGROUND, 32<br>BELOWGROUND TANKS         |
| TOTAL CONSTRUCTION COST             | \$3,227,566 |  |
| I. POWER                            | \$ 2,000    |  |
| II. CARBON ADSORPTION               | \$ 23,820   |  |
| III. MISC/CONTINGENCY               | \$74,318    |  |
| TOTAL ANNUAL O&M COST               | \$100,138   |  |
| TOTAL PRESENT WORTH                 | \$3,500,242 |  |

SUMMARY OF COST ESTIMATE  
\*ALTERNATIVE MOM-3

|  |              |   |
|--|--------------|---|
| I. GROUNDWATER                             | \$212,960    | 12 WELLS, 6 INCH SS<br>CASING, SUBMERSIBLE<br>PUMPS, WELL DEVELOPMENT<br>ETC. |
| II. PRECIPITATION/<br>CLARIFICATION SYSTEM | \$79,000     | PACKAGE PLANT   |
| III. FLOATING PRODUCT REMOVAL              | \$120,120    | PUMP, TANK, TRANSPORT<br>AND DISPOSAL   |
| IV. AIR STRIPPER                           | \$29,500     | TOWER, ASSOC. HARDWARE  |
| V. CARBON ADSORPTION (LIQUID)              | \$39,000     |   |
| VI. THERMAL TREATMENT                      | \$1,761,750  | VERTIDE UNIT W/<br>SCRUBBER, QUENCH<br>SYSTEM, INSTRUMENTS AND<br>CONTROLS.   |
| VII. MISC.                                 | \$127,000    | MODELLING, PUMP TEST,<br>SURVEY ETC.  |
| TOTAL CONSTRUCTION COST                    | \$3,316,921  |   |
| I. POWER                                   | \$328,033    |   |
| II. CARBON ADSORPTION                      | \$11,000     |   |
| III. MISC/CONTINGENCY                      | \$253,826    |   |
| TOTAL ANNUAL O&M COST                      | \$592,859    |   |
| TOTAL PRESENT WORTH                        | \$12,430,350 |   |